



The Shell or Telescope Crown.

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VII.

(Continued from page 97.)

(Reverse Process: Advantages, Disadvantages, Procedure: Original Model, Mould, Swaging-Model, Blanks, Swaging, Methods, Scott's Method, Finishing).

Reverse Process.

In the preceding process it will be noted that in the detail of swaging, the blank is conformed to the outline of a *mould* or *die* of the original model, by *expanding* or stretching it. This is termed the "*inside-out*" method, and, while it is perhaps most generally used, the extreme thinness of the finished crown, augmented by the necessity of beginning with so thin a gauge, very constantly occasions the objectionable features already intimated in this connection.

As a means of overcoming such objections, and obtaining increased thickness and strength, the *reverse* or "*outside-in*" process of swaging has been devised.

In this method the blank is conformed by being *compressed* over a metal reproduction of the original model, instead of being *expanded* to meet the walls of a mould of it.

Advantages. While the process of swaging is perhaps more difficult to accomplish, the results are advantageous in being productive of a *heavier* and more *uniform* thickness of gold in the finished crown, and of greatly diminishing, if not entirely overcoming, the probability of tearing it.

Disadvantages. The result obtained by swaging the gold over the outside dimensions of a metal reproduction of the original and desired form, would seem to be objectionable in that the crown so conformed must be somewhat larger than the model. This, together with the tendency of the gold to overlap and knuckle here and there, during the swaging, are logical disadvantages, unless means are observed for overcoming them.



Fig 99

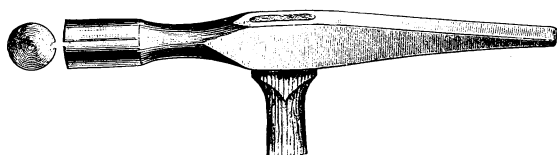


Fig 100

While the overlapping and knuckling may be easily avoided by careful manipulation of the gold during the process, the difference in size occasioned by the thickness of gold can be overcome *only* by using *force* enough in swaging to so compress the die by this impact as to compensate for this thickness, or, by *removing* the primary band just previous to reproducing the metal model.

In view of the characteristics of the lower melting fusible alloys which are necessarily used, and of the thinness of the gold after being drawn down to the required size blank, it is possible that fairly accurate results may be obtained by depending upon the compression of the metal model from the force and impact of swaging; yet as this is more or less uncertain, the removal of the band will doubtless afford the most positive and accurate results.

Procedure. As the *variation* between this and the preceding method pertains only to the manner of securing the dies, and to the process of swaging, the procedure up to the point of obtaining the model is identical with that already outlined.

When the crown has been removed from the articulator, and its plaster base trimmed to the required form as previously indicated in Fig. 92, it should then be *reproduced* in fusible alloy, instead of obtaining metal dies of it in the form of a mould.

If the band is to be removed from the model, the plaster base should be trimmed away sufficiently deep so as to leave a distinct cervical outline to guide in trimming the crown after swaging. The removal of the band may be easily accomplished by cutting through it, longitudinally, at a convenient point, with a fine saw or file; after which the entire plaster outline should be nicely smoothed down, and then varnished.

The mould is obtained in the same manner formerly pursued in securing the dies, *excepting* that it is made of *plaster* instead of metal. The varnished model should be adjusted to the casting flask, or similar device, with pieces of cardboard *in situ*, Fig. 95, and thin plaster then poured upon it. After crystallization this may be broken open, the model removed, and the parts replaced and adjusted to the flask.

When the plaster has become sufficiently dry, this should be filled with fusible alloy which melts at, or below, the temperature of boiling water. The metal model thus resulting, Fig. 99, is identical with the original model, and over this the blank of gold is conformed by various processes of swaging.

After drawing the blank to a size which will fit snugly over the swaging model, or securing the same from the supply houses in ready-made form, it should be first thoroughly annealed, as any subsequent annealing is prevented after the swaging has been started, because of the necessity for the destruction of the swaging model, by melting it, to admit of the removal of the blank.

In conforming the blank to the outlines of the swaging model, considerable care must be exercised to prevent knuckling and overlapping of gold by any method employed. This can only be accomplished by frequently removing the crown and working out such places with a small riveting hammer, Fig. 100.

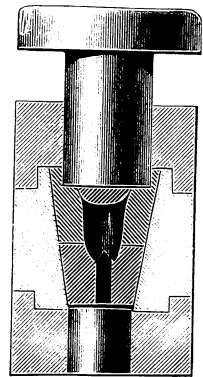


Fig 101

Methods.

While several systems and devices have been designed for the purpose of swaging crowns by this process, the cylinder and plunger are the essential features of the most useful ones, and hydraulic pressure may be very serviceably employed.

Ash's crown swaging device can be made to answer the purpose by boring out the end of the plunger until it presents a cone shape equal to the depth of the crown, and a similar apparatus especially designed to meet such requirements constitutes a portion of the seamless crown outfit manufactured by Mr. J. W. Place, of New York City. The *cone shape plunger* is necessary in order to distribute the impact evenly over the entire surface of the crown.

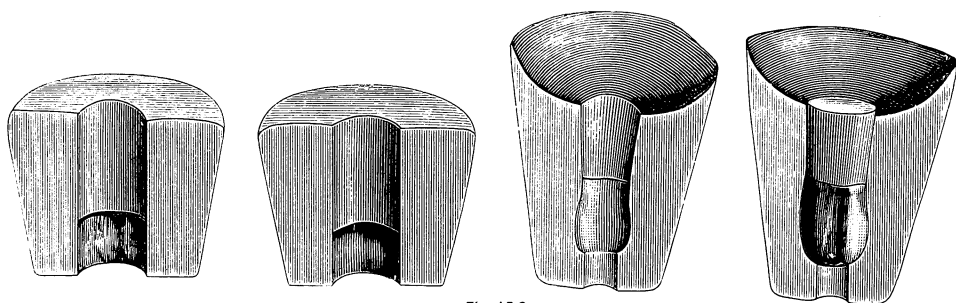


FIG 102

In the use of such devices the blank should be fitted over the swaging model and gradually worked down to place with the riveting hammer. This should be placed in the center of the cylinder and filed bird-shot or, preferably, stiff putty freely mixed with lycopodium or soapstone, then packed closely around and over it until entirely submerged. The plunger should now be inserted and gradually driven to place, removing the crown frequently and working out the overlaps, until the swaging is completed.

A recent invention for this purpose possessing much merit is the apparatus designed by Dr. W. P. Scott, of Chicago, which consists of an inverted cone shaped cylinder, and straight flat-surface plunger, with other necessary accoutrements.

In the use of this system the blank is fitted to the swaging model as indicated, and the occlusal surface first swaged by driving the same into a surface of lead. After this portion of the crown is adequately swaged, it is then placed in a matrix afforded between the two surfaces of lead, which are formed in a mould accompanying the outfit, and the

whole then dropped into the cylinder. The base and top of the latter are adjusted, and the plunger inserted, (Fig. 101,) which upon being driven deeper into the cylinder so compresses the lead matrix, and the gold blank, as to closely conform it to the outlines of the swaging model, with a minimum tendency to tear or overlap, and with a maximum and uniform increase in the thickness of the gold. The lead matrix before and after swaging, together with the crown in position in the latter, are illustrated in Fig. 102.

Finishing. When the swaging has been adequately accomplished by the method selected, very little finishing is usually required. The crown should be polished before detaching it from the metal model, after which the latter should be melted by placing in *boiling water*, and any adhering or remaining particles removed by the acid bath. The surplus gold at the cervical portion should then be carefully trimmed away to follow the outline indicated, when the necessary reinforcement and final polishing may be given.

(To be Continued.)

A New Vacuum Chamber.

By DR. J. ALLEN JOHNSON, Smyrna, Del.

How often it happens that we see our very best effort in the way of an artificial denture fall under the ban of the patient's ultimatum, "It has no suction, Doctor. I can't keep it up."

Despairingly we contemplate the patient's look of disgust and listen to his eulogy on the stability of his neighbor's plate. We see our intelligent effort to conform the artificial substitute to the requirements of temperamental attributes; the hours we have spent endeavoring to obtain a physiological occlusion—"a la Bonwill"—and the successful restoration of labial expression, all go down like a fallen idol, because, "it has no suction."

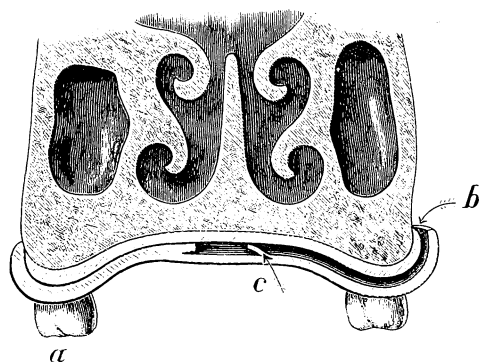
Useless to explain to the patient that his palatal arch is not formed like his neighbor's, or that a hard, flat palate with a prominent bony ridge extending along the mesial line is most unfavorable to the plate's stability. Better to turn our attention to the cause or causes of the lack of proper adhesion, so that in the remaking, we may be able to overcome these defects and see our efforts crowned with success.

The proper preparation of the model for full upper denture, in regard to the scraping of model adjacent to the mesial ridge and the relief

of pressure upon this ridge when the finished plate is *in situ*, is familiar to all; but the manner of maintaining a partial vacuum under all circumstances is humbly submitted as the theme of the present article.

Granting that a perfect impression of the mouth has been obtained, using plaster not too thickly mixed, and the palate carefully cleansed with napkin before introducing the impression tray, we come to the pouring of the impression; and how many good impressions are ruined at this point by the use of varnish entirely too thick, and in addition coated with thick oil or soap suds? The thinner the varnish, the better, and soapy water rinsed off under water cock or the use of porpoise oil will not materially injure the plaster cast which we are about to obtain.

After setting up on the articulator, the model is scraped or lined as the case may require; then the regular vacuum chamber form is placed



in position, and just before packing the case around this is laid a narrow (about one-eighth inch) rim of flexible or palate rubber, and over all is laid a piece of thin tinfoil neatly shaped to come flush to the outer edge of the flexible rubber. The packing of the case is now finished in the ordinary manner, and after vulcanization and removal of the metal chamber and tinfoil form, the palatal surface of the case will have the appearance of the ordinary case excepting that the margin of the vacuum chamber will be of the flexible rubber and will present a free edge or lip, of the width of about one-eighth of an inch, as shown in the illustration.

On the flexibility of this elastic rim lies the secret of an unbreakable suction, for it will yield to atmospheric pressure when the plate is under pressure on the opposite side, and thus prevent the ingress of air on the side of the plate not in perfect apposition to the mucous surface. (See figure.)

I have given this new form of vacuum chamber a severe trial in a number of difficult cases wherein I had completely exhausted my resources in a vain endeavor to construct upper dentures possessing requisite adhesion, and in each case in which I have used it, the results have been highly satisfactory to both the patient and myself.

Another valuable feature of this form of vacuum chamber is the absence of irritation to tender palates, a matter of no small consideration in many cases.

Obturators Carrying Dressings in Suppurative Cleft Palate.

By DR. HENRY JASZ JAULUSZ, New York, N. Y.

Case 1.

Mr. N. N., aged sixty-four years, was inoculated with syphilis, some twenty-four years ago, at which time there occurred a discharge in the upper maxilla, which caused softening of the palate. Several years after this he lost his entire upper set of teeth, and the cleft commenced to make its appearance, at the same time causing a disagreeable discharge of mucous. The patient having neglected treatment, not having in time stopped the progress of the disease, could only with difficulty articulate.

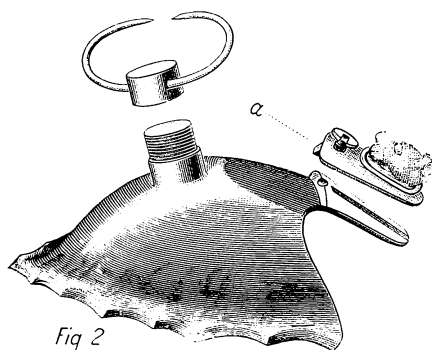
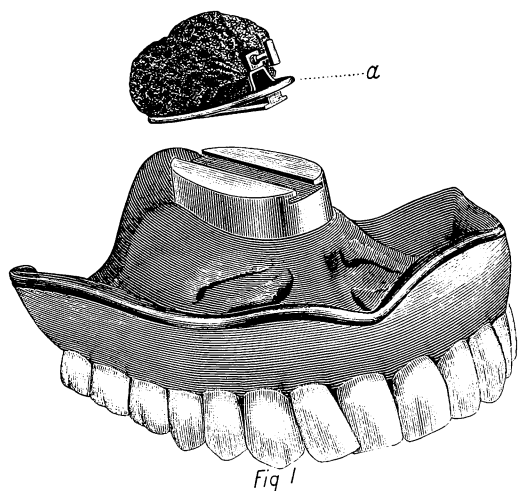
At first I simply made him an ordinary obturator, but I found that at times the discharge was running down his throat, causing nausea; to remedy this I concluded that the only successful appliance would be one which would absorb the mucous.

The accompanying illustration, (Fig. 1) shows the form of the instrument. This plate has done its work fully to my expectation, as the patient is now not only able to speak plainly, but also to eat and masticate his food properly. The disagreeable discharge and running into his throat is now a thing of the past. On the palatal surface of the plate is a small box which is hollow, and which receives the slide holding the sponge. The patient is enabled to remove this latter (Fig. 1a) and replace a clean silk sponge every day.

In taking the impression in this case, the patient was placed in the dental chair, holding his head at an angle of forty-five degrees. After washing the

The Impression. cleft with a three per cent solution of carbolic acid, a piece of cotton was immersed in soapy water; this was placed into the cavity and again removed; then an ordinary piece of wax softened in hot water was placed

into the cavity, using a piece of linen immersed in hot water to smooth the wax evenly with the palatal surface. Then I placed three sticks of wood into the wax, each of which had a small hook. Then I proceeded with the impression, taking a large cup filled with plaster of paris, leav-



ing the same in the mouth until properly set, and then removing it with the sticks, wax and all.

Case 2.

The second appliance (Fig. 2) serves as an obturator and also as a dressing carrier. The patient, Mr. P. S., was suffering from syphilitic cleft palate,

which made its appearance a number of years ago; in addition to that, on the uvula, some time ago an ulcer made its appearance.

The surgeon found it difficult to keep the proper dressings in place, and for that purpose I have made on the center of the plate an extension in combination with a small slide, which carried the gauze or usual dressing (Fig 2a). The patient changes the treatment by removing the plate, placing a fresh dressing, which is held in position by two hooks that are removable; the slide is also removable.

Experiments with Plaster to Test Warpage.

BY DR. STEWART SPENCE, Harriman, Tenn.

In the late Prof. Richardson's valuable and well-known text-book, "Practical Treatise on Mechanical Dentistry," fifth edition, is given an account of an experiment in plaster of Paris by Dr. Bowman Macleod, late professor of the University of Edinburgh, Scotland, which would, if the professor's deductions were correct, be of exceeding value. As I have lately conducted a series of experiments myself along this same line, and arrived at conclusions opposite to those of Dr. Macleod, and as the subject is very interesting and important in itself, the more so because it has entered into the standard literature of dentistry, I here submit the matter to the attention of the profession.

To present the case clearly, I will quote from Dr. Richardson's book. Commencing at the third paragraph on page 167 (and immediately after a paragraph in which he pays a very flattering compliment to my own previously quoted "Experiments in Plaster of Paris"), he says:

**Dr. Macleod's
Experiments with
Plaster.**

"A singular and hitherto unobserved phenomenon in connection with the setting of plaster mixed with plain water is pointed out by Dr. Bowman Macleod, of Edinburgh, from which he draws conclusions so practically important concerning its influence in modifying the adaptation of a dental substitute, as well as in other respects, that space is here given to such of his observations as are deemed essential.

"A block of plaster was cast within a square of two feet, which on the following day showed an expansion of five-sixteenths of an inch in length and breadth. But I found, he says, that not only had the plaster expanded, but the upper surface was raised; and on sawing the block

through in a diagonal direction, I found that instead of the block lying dead upon the plane beneath, it presented a concave surface toward the plane, the highest point of which measured one-half inch. This shows, first of all, that the plaster had not only expanded, but had done something more than its now greater length and breadth would lead one to suspect; for, in thus taking a concave form, it must have either retracted to an equal extent, or expanded in an irregular manner, causing warpage.

"Making still further experiments by casting plaster in the ordinary impression cup, I found invariably the same results produced, and that the center portion—the palatine portion—of the cup always presented an open and well defined space between the upper surface of the impression cup and the lower surface of the hardened plaster. This circumstance, therefore, would produce in your model a fault similar to that resulting from the sucking of the waxy or resinous impression materials, and, as you can readily see, would give you a much higher dome than that of the natural arch. Hence the rocking of the plate, which has hitherto been attributed, if my deductions be justified, to every cause but the right one. * * * Naturally, then, I began to inquire how this defect might be overcome; and I find that by the addition to the water with which the plaster is mixed, of potash alum (hitherto used entirely for the purpose of quick setting in impression making) in the proportion of from three to four ounces to the gallon, you will entirely overcome the irregular expansion and consequent warping which takes place in coarse plaster of Paris as used with water alone. Here you have the two blocks of equal dimensions, one cast with water and the other with potash alum water. It requires no explanation on my part to point out the difference between the two. In one case the expansion is five-sixteenths of an inch; warpage, one-half inch. In the other, expansion, nil; and warpage, ditto; and the two surfaces dead. * * * The conclusion I draw from this is, that all plaster, either for impression making or for models, should be cast with potash alum, when strict and definite results are to be obtained, and that in the case of gum block work the opening of the joints * * * may now be entirely prevented by the use of potash alum for both matrix and model within the flask."

It may be remarked in passing that the professor in writing this closing sentence evidently overlooked the fact that plaster yields under compression, and that the pressure of the model, through the rubber, on the blocks forces them outward and apart, compressing the plaster investing them. But that is a small matter.

If it were true that potash alum (the sulphate of alumina and potassium; now officinal) would totally prevent expansion of plaster of Paris, it would

Potash Alum.

be a very important fact; but I have every reason to believe that such is not a fact.

The attention of the dental profession in America was first called to potash alum by Dr. Thos. Fletcher, of Warrington, England, in an article in the *Cosmos* of March, 1883. In referring to some experiments I had made in plaster with ammonia alum (the sulphate of alumina and ammonia; the official), he said:

"Alum, as properly understood, means the sulphate of alumina and potash (potash alum). Its action with plaster of Paris is totally different from that of ammonia alum, which for some years past has been sold in the place of potash salt, to which the name was originally given. A solution of potash alum, boiling hot, instead of softening plaster, will make it so hard that it is difficult to cut or break, and it will cause plaster which has lost its power of setting to set again, although not sufficiently hard for use."

I obtained some of the then rare potash alum, but was unable to produce with it casts that were especially difficult to cut or break. While setting hard, they do not, in my experience, set much harder than plain plaster, even when mixed with water boiling hot. Worse still, I was unable to get any less expansion with potash alum than with the ammonia variety.

About a year ago I renewed my experiments with potash alum, but with similar unsatisfactory results. Some eight or ten casts, poured in an upper impression cup, in proportions of alum averaging from six to forty grains to the fluid ounce of water, showed best results with six grains. The very large quantities set free a gas which, if the mix was not stirred long, produced a porous cast; and long stirring causes expansion. Its power of reducing expansion was, at the best, but about fifty per cent. or less.

Thinking that possibly they have a different alum in Great Britain to that in use here, I wrote to the Dean of the University of Edinburgh. Dr. Macleod was, as I had heard, dead. My letter was referred to Dr. Munro, Lecturer on Prosthetic Dentistry, who answered it, admitting that in his opinion Dr. Macleod's experiments "did not prove that there was no expansion, but only that there was no warpage in the one cast with potash alum, and that the expansion was less." This confirmed my views as to the limited power of potash alum in controlling the expansion of plaster.

Dr. Munro also gave me a piece of information which led to the solution of the mystery of the "doming" of the two feet square block of plaster cast by Dr. Macleod. He said that Dr. Macleod had surrounded his plaster with an iron band, and that the plaster square was only two

inches in thickness. It immediately occurred to me that this iron band had caused the doming of the central region by preventing lateral expansion. And if this were true, it would, of course, follow that the flanges of our impression trays act similarly. I had previously been impressed that the large space often seen between the tray and the plaster impression at the palatal arch was too great to be accounted for by the linear expansion of the impression.

**Dr. Spruce's
Experiments.**

I therefore imitated Dr. Macleod's experiment, though on a much smaller scale, by pouring plaster in a cast iron ring about four inches in diameter on a marble slab. In order to discourage this mix from bulging downward instead of upward, I laid a board on the top of the iron ring, but so as to not touch the plaster, and placed on this board a weight consisting of a zinc die and lead counter die. I then poured an equal quantity of plaster on the marble slab beside the other, but without any band around it. These casts when hard were each sawed asunder in the midst, and it was found that the encircled one had domed up, while the other remained flat. Thin pieces of paper could be drawn without strain from under the banded cast at any point distant an inch or so from its circumference. This experiment was again made, this time with a different plaster, but with similar results. The latter two casts were not sawed asunder, but tested for doming by moistening the surface of the marble slab and laying them down on the wet surface. The banded cast absorbed only the moisture near its circumference while leaving a little pool in the center, but the other dried up the entire region on which it lay, and its suction to the slab was also much greater than that of the other.

**Second
Experiment.**

Although this was conclusive, a further test was made thus: I took a smooth board about sixteen inches long, and screwed down on its face at each end a cleat, then poured plaster on the board reaching from cleat to cleat. This strip of plaster was about three inches wide and three-fourths of an inch thick; its length was thirteen inches. It was left free at the sides, and confined only at the ends. It was clear that if the warpage described by Dr. Macleod arose from his iron band, and not from any phenomenal disposition in plaster to draw up in its center, this strip of plaster would bow up at or near its middle, and that another strip not confined by the cleats would lie flat. I had not long to wait, for in half an hour this bowing up was observable, and by next morning four sheets of paper (cut from the advertising pages of *ITEMS OF INTEREST*) could be inserted between the plaster and board at the

point of greatest doming. It was then removed from the board to make room for the plaster of the next experiment, and on being placed back three or four days later it was found to have arched yet more; so much in fact, that twelve thicknesses of the same paper would now go between it and the board. This gave a space of about one-twentieth of an inch. I am utterly at a loss to comprehend this latter warpage, for numerous experiments with plaster in impression cups seem to indicate that warpage does not continue after expansion ceases, and expansion ceases in a day or two.

Next, on the same board, but not quite reaching to the cleats, was poured a similar strip of plaster. This latter showed no bulging, but lay perfectly flat on the board, and remained so after being removed therefrom. At no time since has it shown any warpage. Having been allowed to expand laterally, it had no desire to bulge or dome. It may be doubted that plaster ever warps, as used in dentistry, except for the cause here indicated.

Unfortunately I found no way of carrying this line of experiment into the impression tray itself; but this was not necessary, for these previous experiments were demonstrative. The effort of the plaster to expand laterally meets with the resistance of the unyielding flange of the tray, and the plaster domes up at the palatine arch. I found by experiment that a tray with a removable flange, consisting of a strip of cardboard paper waxed on to the tray (from which the metallic flanges had been cut) before taking the impression, and stripped off immediately after, largely prevented this bulging by permitting almost free lateral expansion. But this is a doubtful advantage for what the impression gains by preventing doming at the palate, it loses from expansion outward, and therefore it is a question of two evils. In a mouth with soft palate, the doming might be preferable to the lateral expansion.

It is obvious that a similar bulging occurs in the model, which meets in the buccal and lingual surfaces of the impression similar resisting walls to those met by the impression in the cup. Nor do these two bulgings counteract each other, for both proceed in the same direction. By this restriction of the lateral expansion and doming in the center, the resulting plate would fit closely to the buccal and lingual surfaces, but rock on the palate. How far the removal of the entire upper portion of the palate by a relief chamber of large area would counteract the two domings under consideration, I cannot say, but should imagine the results would be good, especially if the tin used to produce the relief be only just thick enough to counteract the warpage without creating a permanent chamber.

However, this means of relief does not especially interest me, as I have found an agent capable of entirely preventing the expansion of plaster of Paris, and even, if need were, of producing contraction in it; and also because this warpage of impression and model is only one of several features which have to be considered in making vulcanite plates on plaster models in order to produce exact adaption, on which I have made some important discoveries from experiments, all of which I hope to be able to publish to the profession in a little while.





Bleaching of Enamel and Dentine.

BY JOSEPH HEAD, D.D.S., Phila., Pa.

Read before the Central Dental Society of Northern New Jersey, Nov., 1901.

The necessity for bleaching tooth substance is always to be considered from two aspects: the æsthetic and the hygienic. When in times past, the discoloration occasioned by a shining gold filling, was considered a mark of beauty and of aristocracy, lesser stains on the enamel were unnoticed, but with the advent of porcelain fillings, the necessity for removing discolorations in dentine and enamel, became a crying necessity. And yet great as this æsthetic necessity is, the greatest necessity of all, is cleanliness and hygiene. For when the enamel is infiltrated with germs of decay, even though it appears hard and smooth to the instrument, the life of that enamel is on the ebb.

Microscopic slides of Miller and Choquet show this only too plainly and fillings placed in such enamel margins are from the start, doomed to failure.

When a pulp is removed from a tooth and the cavity is filled without proper antiseptic treatment of the dentine, and that dentine becomes discolored, it is a subject for serious consideration, if such decomposition may not have a harmful effect upon the cementum. Even latent decay is a serious menace, and we should never lose sight of the fact that any bacterial stain in enamel or dentine, may only need a chance stimulus under favorable conditions to become a forerunner of a cavity. These stains may be removed by bleaching and polishing, yet as bleaching is sterilization to extermination, it is more effective than polishing, which in most instances, only removes the outer part of the bacterial colony.

The difficulty of bleaching a tooth internally by medicaments applied to the dentine is inversely proportional to the necessity, for that half of the crown adjacent to the cutting edge of a discolored tooth is the portion æsthetically most important to bleach, and as before noted, it is

just that portion which the bleaching fluid cannot easily reach through the dentine. How often in times past, have we been able to bleach the cervical half of a crown, while the other half defied our utmost endeavors, because the dentine tapered to the thinness of paper long before the cutting edge was reached. And, therefore, it is evident that numerous failures will continue unless stained enamel can be bleached by external applications.

Such a method of bleaching enamel was employed by me over two years ago in an endeavor to restore the color of teeth in which porcelain inlays were to be placed, but since that time, the same method has been successfully used to remove permanently, stains in the apparently sound enamel of teeth with living pulps, and to remove the germs of general superficial decay, where fillings heretofore had proved unable to withstand the attacks of the bacteria.

**Cases from
Practice.**

I have in mind, one patient, the necks of whose teeth were literally covered by superficial decay. The gums were extremely sensitive; fillings had to be replaced every six months, each time larger than before; mouth washes proved valuable for the soft tissues, but from their lack of penetrating power they were useless in retarding the enamel decay. It took five visits to thoroughly sterilize all of his teeth, when the enamel looked normal, the gums became healthy, and to my surprise, the patient volunteered the information that the teeth were much less sensitive. This was especially interesting, as I had thought the method might possess the drawback of making the pulps temporarily more sensitive.

Another patient came to me with his teeth covered with the well-known green stain. Ordinary polishing and brushing proved useless, as the enamel had been pock-marked by measles during childhood. We all know that æsthetic trouble these pock-marked teeth give us, not so much from the inequality, but from the stains at the bottom of the depressions that it seems impossible to remove. A single treatment to the central, lateral and canine made the stain melt from sight; the enamel became normal in color and by the use of brushes and mouth washes, remained so.

**Method of Bleaching
with Pyrozone.**

Let us now consider the method itself. Peroxide of hydrogen and peroxide of sodium when heated give off oxygen in great quantities. This nascent oxygen at the moment, when it leaves the compound, is most caustic, and, therefore, if we can liberate this gas directly on a tooth, we shall be able to remove any organic stain. Either pyrozone, which is a 25 per cent solution of peroxide of hydrogen, or sodium dioxide can be used. These two materials seem equally power-

ful, but they are somewhat different in their actions, and, therefore, would better be described separately.

If the stained tooth is pulpless and the apical ends of the canals have been tightly sealed, the treatment should be as follows: Apply the rubber dam and tie one if not two ligatures around the neck, so that leakage is impossible. Let the rubber dam go slightly over the nostrils of the patient to prevent the fumes of the nascent oxygen from irritating the air passages. Oil should be rubbed on the hands of the operator and on the face of the patient. The tooth should be dried internally and externally. Cotton soaked in pyrozone should be packed in the canal and a hot ball burnisher, such as is used in plastic work, should be placed against the cotton, so that the steam of the nascent oxygen will be driven through the tooth substance. After the cotton becomes dry, it should be removed, and the tooth heated again internally with hot air, when the process described above can be repeated several times. Finally, cotton soaked in pyrozone should be sealed in the canal with hard gutta percha, so that any gas that is given off, may by pressure, be driven throughout the dental tubules.

Then we are ready for the second stage of the process. The enamel should be thoroughly dried with hot air blasts and heated instruments until the patient feels the heat of the tooth in the gum. This makes the oxygen within the tooth canal exert great pressure; then a piece of cotton soaked in pyrozone, should be placed on the enamel, and a broad, hot instrument held against it, so that the steam shall be driven in from the outside. This should be continued until the cotton becomes dry, when the enamel should be ironed with a highly heated ball burnisher. This drives out the pyrozone that the enamel has soaked up, and in driving it out, liberates the nascent oxygen within the enamel substance. The effect of this last-mentioned ironing is most marked and the stains can be seen perceptibly to whiten. This process can be repeated in its various stages as often as desirable, and when the patient leaves, fresh pyrozone should be sealed in the canal with gutta percha, in order that the bleaching process may continue until the next visit. If, finally there is a slight stain that the nascent oxygen will not remove, a strong solution of oxalic acid should be used in the same way. The oxalic acid is not only a powerful oxidizer of organic material, but will also charge any iron stain to a colorless oxalate.

What has been said about the use of
Peroxide of Sodium pyrozone, with a few cautions, applies equally
Method. well to peroxide of sodium, as both bleach primarily
by setting free nascent oxygen. The peroxide of
sodium is most valuable where oil in the tooth is to be saponified, and,

therefore, it will sometime succeed where pyrozone fails; however, we must remember that when peroxide of sodium touches the soft tissues, it makes a deep burn, which pyrozone would not, and, therefore, great care should always be used that the sodium dioxide does not escape from the protection of the rubber dam. When this compound is placed in hot water, the oxygen is given off so rapidly that a distinct puff is heard, but when it is melted on ice, a thick paste of the undischarged sodium dioxide can be obtained which when placed upon the dried enamel, and heated with a hot instrument will safely give off a tremendous quantity of nascent oxygen. This oxygen, as previously stated, will bleach the enamel of a tooth where the pulp is alive. When peroxide of sodium has been used it should be carefully washed off with water and neutralized with a weak acid. Before the rubber dam is removed, always be sure that none is left to burn the mouth. It is also for the same reason, dangerous to seal it up in a tooth canal unless the utmost precautions are taken against its escape.

Dr. Miller has, I believe, noted that concentrated peroxide of hydrogen under certain conditions, may attack the organic matrix that holds the enamel rods together. This is a warning that should be noted and considered. But in spite of this warning, the good results obtained by me might be explained, even though Dr. Miller's observations were generally true.

Enamel that is sterilized of its infecting bacteria is better able to preserve its integrity by the use of antiseptic washes, even though the matrix may have been slightly weakened by the bleaching agent, than infected enamel, the matrix of which is being constantly thinned by bacteria that lie too deep for an ordinary wash to reach.

But whether this method even theoretically injures the enamel, is a subject for future research. This much, however, is sure, the method presented tonight has permanently bleached stained enamel and that enamel has kept its normal color and integrity for over two years.



Urinalysis for the Dentist.

By H. H. Boom, M.D., Philadelphia, Pa.

Read before the Southern Dental Society of New Jersey, Dec. 18th, 1901.

On certain occasions it is not only desirable, but it is essential, that the dental practitioner shall make a clinical examination of a patient's urine. This is particularly true when it is proposed to administer, to the patient, a general anæsthetic.

Danger of Anæsthetics.

A patient presenting himself for dental treatment may be, at the time, suffering from an unrecognized or masked renal disease. If, to such a patient, a general anæsthetic be administered, his physical condition becomes infinitely worse, and his disease, assuming an active phase, soon reaches a fatal termination. A few unfortunate cases of death in the dental operating chair, during the administration of a general anæsthetic, have been reported.

If the dentist takes the time to perform a few of the simpler tests, upon the urine of their patients, the results would show whether the administration of ether or chloroform be admissible. It is not expected that the dentist make the exhaustive examination of the urine that is often required of the physician, but he should ascertain with certainty the presence, or absence, in the urine, of albumen and of glucose. A knowledge of the specific gravity will prove of considerable help, by indicating the tests necessary in our inquiry.

Normal Urine.

In conditions of health, the urine has a specific gravity ranging from ten hundred and fifteen up to ten hundred and twenty-five. Should the specific gravity be lower than ten hundred and fifteen, the urine should be examined for albumen. If the specific gravity of urine be much greater than ten hundred and twenty-five, a careful search for glucose should be made.

Obtaining Specific Gravity of Urine.

In obtaining the specific gravity of urine, we can make use of the urinometer. Perhaps a neater method for obtaining the specific gravity of urine consists in the use of the specific gravity beads. An instrument is offered us in the shops that enables us to use the specific gravity beads with neatness, and a fair degree of accuracy. It consists of a cylindrical glass tube, resembling a small test tube, constricted and open at both ends. Inclosed in this tube is a series of six glass beads, each bead plainly numbered; the beads bearing the numbers, "5," "10," "15," "20," "25," "30."

The beads are placed in regular order in the tube, the lowest in number being at the upper part of the tube, the bead numbered "30" at the bottom of the tube. The glass tube is then constricted above and below the beads so that the latter cannot drop from the tube, although they can move freely along the tube without, however, passing each other.

To use the appliance, we close the lower end of the tube and fill the tube with urine. We may find beads numbered "5," "10" and "15" leaving the rest and floating towards the top of the tube, while the other beads stay at the bottom of the tube. This would indicate that the specific gravity of the specimen was greater than ten hundred and fifteen as the bead numbered "15" had floated towards the surface of the liquid, but the specific gravity of the liquid was not as high as ten hundred and twenty, as bead numbered "20" was not upborne by the liquid.

After using the instrument, it can be readily cleaned by flushing it with water.

It must not be thought that all specimens of urine having specific gravities lower than ten hundred and fifteen or greater than ten hundred and twenty-five necessarily imply existence of disease. Nor, on the other hand, should we infer the absence of disease, in our patient, if the urine has a normal specific gravity.

**Trustworthy Test
for**

Detecting Albumen.

We first make a saturated solution of common salt, chloride of sodium, in distilled water, being sure to add to the water all the salt that will dissolve, and if the resultant liquid is not perfectly clear and transparent, filter through cotton or paper. This solution will keep without change.

To test the albumen, fill a test tube about three-quarters full with urine, then add the saturated salt solution until the tube is full of the mixture, add two or three drops of strong acetic acid, and holding the tube in the fingers by its bottom, heat the upper layer of the fluid over a bunsen flame, or lamp chimney, until the mixture boils. Then, without shaking the tube or its contents, examine the layer of fluid in the upper part of the tube, comparing its degree of transparency with that of the fluid that was not heated in the lower part of the tube. If the heated portion of the fluid is in the slightest degree hazy, or less transparent, albumen is positively present.

**To Detect the
Presence of
Glucose in Urine.**

Place urine to the depth of an inch in a test tube. Add half as much liquor potassæ, U. S. Ph., to the urine. Mix the two fluids by shaking the tube. Then add two or three drops of a five per cent solution of copper sulphate in distilled water. Do not

heat this mixture, but allow the tube to stand, undisturbed, for from twelve to twenty-four hours in the cold. At the expiration of that time, if glucose be present, there will collect in the tube an ochre yellow to brick red precipitate of fine sand-like character of sub-oxide of copper. This test is a multiplication of Trommer's test, and, unlike the usual form of Trommer's test, requiring application of heat, the formation of sub-oxide of copper can only occur through the presence, in the urine, of glucose and of no other substance.

Tin!

A Plea for More Conservative Methods in Filling Teeth.*

By DR. T. D. SHUMWAY, Plymouth, Mass.

Read before the Vermont State Dental Society, March 21, 1901.

In submitting this subject for your consideration, we wish to disclaim any intent to show superior manipulative ability in the use of cohesive gold, or to merely demonstrate by a novel experiment the possibility of uniting gold with tin, by simple contact. If this were the only reason for appearing before you, it would be well not to consume valuable time which could be more pleasantly and profitably employed. I trust, in this society, the day has gone by, when exhibitions of this character continue to excite either wonder or admiration. That there have been demonstrations of this sort far beyond the mechanical skill of your essayist to excel, or even emulate, no one is more willing to concede.

It is for the purpose of presenting the hackneyed subject of filling teeth in a somewhat different manner from that in which it is usually treated, that the above title was selected, and these specimens of the work submitted for your inspection. These specimens are not intended to be like those made with cohesive gold and the mallet. In their physical construction, they are radically different. Whatever value they possess arises from this fact.

**Failure
of
Cohesive Gold.**

Had the use of cohesive gold and the mallet met the expectations of the profession, it would be presumptuous indeed to attempt to offer anything in its place. It is true, the skill displayed in the repair of wasted and broken tissue, by contouring, has been

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something remarkable. Manual dexterity has reached a high state of development, but the results obtained have been at a fearful sacrifice of tooth structure. History repeats itself, and the same objections which caused the failure of crystal or sponge gold, nearly fifty years ago, applies to any form of cohesive gold when placed in contact with tooth substance by mallet force. In the discussions relating to the use of crystal or sponge gold, it was pointed out, what would follow this plain violation of natural law, in impaired or arrested function. In an article by Dr. J. De Haven White, published in the *Dental News Letter* of July, 1854, the writer says:

"It is believed by some, that a plug must be impervious to dampness; this cannot be, for if it were, it would not be necessarily a perfect plug; dampness must permeate a plug to some extent, or the dampness will force around the plug and displace it, sooner or later. We know well that a distinguished operator in our city loses more hard plugs than soft ones on that account; his plugs are therefore better than the teeth he puts them in. We do not wish to be understood as advocating hard plugs, but we believe the most perfect plug is of about equal porosity to the dentine; with a good cavity it will remain in longer than a harder plug, especially in the lateral portion of the teeth. A foil plug will not be broken up by such permeability, and a sponge plug will. No reasonably good operator loses a plug by softening, but by the margins of his cavity giving away. The constant expansion and contraction of the plug and the tooth will cause any plug to give way sooner or later, and, until we get a substance that will expand and contract with the tooth, so as not to loosen its margins, we will have some of our highest specimens of art crumbling away under our eyes."

It is evident that Dr. White had an intelligent understanding of structure and function. As a student of vital energy, he was able to discern the cause of failure in the use of crystal or sponge gold. Manipulating cohesive gold by the more modern methods, does not remove the objections which he so forcibly stated. The introduction of the rubber dam, made possible operations which before were only partially successful, but the evil was augmented in a more thorough crystallization of the gold by mallet force.

That many teeth have been filled with cohesive gold and the mallet, which fillings have remained for a great number of years, no one will attempt to deny. There are many people that have survived and enjoyed a comfortable degree of health, who have violated the laws of correct living. There is a wonderful recuperative energy in the human organism. But for this, it is a question whether the race would not long since have become extinct, by reason of transgression of natural law. Admitting that some teeth, which have been filled with cohesive gold and the mallet, are doing good service, we believe this is due to the recuperative energy

that was able to overcome the contact of a foreign body incompatible with tooth structure, rather than the influence of the filling itself. With the record of failure, it is fair to say the success of filling teeth with cohesive gold has not been commensurate with the amount of labor bestowed, the physical exhaustion, mental strain, and nervous tension on the part of the operator, together with the pain and suffering the patients have been made to endure. It is significant that crowns and bridges and inlays should follow so closely in the track of cohesive gold and the mallet. It is also significant that those who became the most expert in using gold in this form were early in the field to adopt the later method of cutting off crowns.

**Etiology
of
Tooth Structure.**

When the mallet was introduced for the purpose of condensing cohesive gold, it was assumed that because lost tissue could be restored, the teeth would be preserved by purely mechanical means. Operative dentistry, or the care of the natural teeth, like the practice of medicine, is not an exact science, although it has to deal with scientific subjects. Nature rebels at any attempt to reduce her methods to exact mathematical lines. This is clearly demonstrated by a study of structure and function, in tooth development. This study is necessarily prosecuted under difficulty, for no one is privileged to see the secret workings of nature. The microscope can only reveal what has taken place, but not what is going on in this workshop. If we could examine, under the lens, without first destroying the vital force, what secrets would be unfolded! It is by reasoning from what we know, that we are able to reach conclusions which are to guide us.

In the discussion of this subject, the first inquiry then is, how is a tooth developed, and what are the changes wrought in this wonderful organ from its beginning to old age, or, in other words, how is a tooth builded? At its inception, there is the dental arch, in which appears a groove, and across this groove, which divides it into pockets, there shoots a thin porous bone. In the pockets are follicles, which are the germs or buds of the future teeth. These follicles are connected with the circulatory system by arteries from the internal maxillary branch of the external carotid; veins from the internal maxillary vein, which return the blood, and terminate in the external jugular; and nerves from the fifth cerebral or fifth pair. Here we see that every pulsation of the heart sends forth the material for tooth formation. Embryologists tell us that at the end of the fifth or the beginning of the sixth month of foetal life, the process of enamel formation is about to commence. The cells, which form the external epithelium or Naysmyth's membrane, have performed their function and disappeared. This membrane has a polished surface, and is a

covering for the prisms or rods which are to form underneath. These prisms or rods are held together by what is termed a cementing plasm.

Formation of Enamel.

In the formation of enamel is first seen the form of the future tooth in a cutting edge for an incisor, and a cusp for a bicuspid or molar. The enamel organ when completed is a purely crystalline formation, and, according to the best authorities, is without any trace of organic matter. All crystalline bodies are formed from without, inward, and enamel formation can be no exception to this rule. A little reflection will make this apparent. Take, for example, the shell of a lobster or the skin of a snake. When a lobster sheds its shell, it is provided with a membrane similar to the outside covering of enamel of the teeth, which is highly polished, but extremely tough and flexible. In the process of time, there is formed underneath, and attached to this membrane, a calcareous deposit, crystalline in character, varying in thickness from one-sixteenth to one-fourth of an inch. We can readily see how impossible it would be for the lobster to shed its shell but for this crystalline process taking place from without, inward. Nature provided an inorganic covering which acts as a protection during the process of calcareous formation. Suppose the process to be reversed? It would simply mean the death of the lobster. After the new shell is formed, another membrane appears, and, in due time, the old shell is thrown off, and the lobster comes forth increased in size. In no other way could the lobster get out of its environment, and expand and grow.

What a beautiful sight is a black snake that has just shed its skin—so black and glossy! Now this new skin is pure crystal, and is formed in the same manner as the lobster's shell, only differentiated to meet the habitat of the snake. Nature had to provide an inorganic covering to prevent the snake from being torn and bruised by the stones and bushes, over and through which it crawls.

On a cold winter's day, watch the process of crystallization on the window pane. It is always from the sides towards the center, and never from the center, outward. This is the key that opens the secret chamber of nature and reveals the process of enamel formation for the teeth. When once formed, the enamel plays no part in the life of the organ, any more than the lobster's shell or the snake's skin, except to act as a protecting covering. The enamel of a tooth is the only part of the animal economy which does not undergo decomposition or change. Professor R. R. Andrews, in a paper read before the recent International Dental Congress says, "The finest lenses do not reveal the slightest differences between enamel ground from a living tooth, and that which has laid in the ground for centuries."

**Formation of
Dentine.**

The growth of the dentine is by a process the reverse of that by which the enamel is formed; that is, its growth is from within, outward. Unlike the enamel, it is composed of two distinct parts, minute tubes and a fibrous tissue called the uniting medium. In their arrangement, these tubes radiate from a center. Tomes says, "The center of radiation is the pulp cavity." These tubes ramify in undulations not only towards the enamel, but also dip downward to form the root of the tooth. They also extend through the sides of the root, and are lost in the cementum.

This fact should have an important bearing in the treatment of pulpless teeth. As yet, we have only the framework of a tooth. It is like a house under process of construction, with an outside covering and partition walls. In the work of tooth building, these tubes perform a very important function. They are filled with a substance that is given off from the pulp, which, so far as the microscope can determine, is amorphous or structureless. This amorphous substance, granular in character, changes into a lime salt. This change is going on from the time the tooth is formed until the period of extreme old age, when the pulp almost entirely disappears. There is no part of the human organism where the process of change is carried on more continuously than that which takes place within the teeth. Although the teeth are provided with an indestructible covering, they are the victims of disease.

From some cause, which it is not necessary to inquire into in this connection, the enamel becomes abraded, and the dentine is attacked by caries. Nature has provided for attacks of this kind, by making the point where the amorphous substance is changing into a lime salt, the most sensitive part of the organ. She, at once, sets up the work of repair by a secondary deposit of dentine. The sensation of pain which is experienced, is not only a note of warning, but a cry for help. This cry is for a protecting covering. If the waste is greater than the repair, it means destruction of the organ. The more recent investigations have shown that the work of repair goes on even after the pulp has become inflamed.

In the *Dental Cosmos* for November, is published a paper read before the International Dental Congress at Paris, by Dr. A. Hopewell Smith, of London, on "Certain Adventitious Dentine Associated with Inflammatory Conditions of the Dental Pulp," in which he says that "in the majority of the inflammations, but by no means in every inflammatory condition of the dental pulp, there is found a protecting layer of hard adventitious dentine, which is put in the place of danger; that is to say, opposite the breach by caries of the surface."

Here we see the effort of nature to protect herself even after the

struggle has become hopeless. From this, it would seem that operations upon the teeth, to stay the inroads of caries, should be protective and remedial. The dentist cannot save teeth any more than the practitioner of medicine can cure disease. Nature must work the cure. The aim of operative dentistry should be, primarily, to assist nature, not a display of mechanical skill, in disregard of fundamental law.

**Materials
for
Filling Teeth.**

A study of the materials to place in contact with tooth substance is the first requisite, if we would approach the operation scientifically. A crystalline formation is obstructive when placed in contact with a living or fibrous body. No one could expect to ripen apples by filling them with gravel stones. If you should shoot malleted fillings of cohesive gold into the body, you would invite blood poisoning. The same law governs in the more dense substance of the dentine, which is filled with life. Again, it should not be anchored with dovetails, angles, retaining pits, etc., as nature is above mathematics, and refuses to be bound. This is the reason why Dr. White says "the filling should expand and contract with the tooth," to meet the changing conditions. An amorphous substance, which is undergoing a metamorphosis, demands that the material to be placed in contact with it, shall be structureless as the substance itself.

**Success
with Tin.**

An illustration of this is seen in the way lead or tin becomes encysted when buried in the soft tissue. Of all the materials that have been employed as a tooth stopping, there is none which has shown such preservative properties as tin. It has a history and a record as old as operative dentistry. In 1825, Mr. Sigmond, of Bath, England, said: "In 1783, I stopped a considerable decay in a large double under tooth, on the outside of the crown, or near the gums, with fine tin foil, which lasted for a good number of years."

The saving properties which tin exhibits, when placed in a carious tooth, are well established. The testimony of many skillful dentists bears witness to this fact. The reasons that have been given as to why tin exhibits this property, have been numerous and varied. Some have attributed it to a therapeutic property in the metal; others, like Dr. Palmer, of Syracuse, claim that it is positive to electro-chemical action, and some like Dr. Miller, of Berlin, say that it is germicidal. When compared with other metals, tin may be said to be almost amorphous. Its specific gravity is 7.29; it melts at 342 F.—a little more than twice the boiling point of water. Gold is more than four times as tenacious, and six times as good a conductor of heat. Under the same conditions, tin expands nearly twice as much as gold, but the rate of expansion of gold is nearly twice

as much as tin. Here is a metal that, in its physical characteristics, borders upon the structureless. When tin is placed in contact with the amorphous substance of the dentinal tubuli, it acts as an assistant in the effort of nature to protect herself from untoward external conditions. This, it would seem, is the more scientific reason for its benign influence.

The limitations of tin have been the barrier to its general use. These limitations are its color, softness, and the tendency to what is termed oxidation. Various methods have been suggested to meet these objections, one of them being to make a cylinder of tin and gold foil, and then force this into place, either by the wedging process or the mallet. But this method has only been partially successful. Incorporating gold with the tin, destroyed the attractive appearance of the gold, and the tin would oxidize and wash out when it came to the surface.

Tin and Gold.

The idea of covering tin with gold is not new. It was practiced nearly fifty years ago. The method was to force the gold into a base of tin with a sharp instrument, with the object to simply cheapen the operation. This was the only value the author claimed for this method. In the *Dental News Letter* of January, 1856, in a communication by Dr. F. Y. Clark on "Material Used in Filling Teeth," the writer says:

"Now as gold is too costly, and tin is too soft, what are we to do with those poor patients that are continually seeking our aid? The plan that I adopted two or three years ago, I find as yet, works well. At first, I had many misgivings on account of two metals being placed in contact in the same tooth, but I can see no difference in placing two metals in contact in a tooth than in placing them in contact around it. But I think the evil is more imaginary than real, for so far I have not been able to detect the least trouble. Therefore, when I have a patient who is not able to pay me the worth of the gold used (I speak of teeth with large cavities on their grinding surface), I commence with tin, and fill up the fangs (if I have removed the nerve), also the pulp cavity, and as much of the crown as I safely can. I pack the tin in perfectly hard, leaving or making it flush, and then, with annealed number four gold foil, I finish off. I use number four because I find it can be forced into the little threads in the walls of the cavity better than any other number, when annealed. Now I cannot see why such a filling is not just as good as if it was all gold. The tin cannot wear nor corrode, for it has not the slightest chance, and the gold on the surface is hard enough to resist all antagonists of the mouth, and, as the cost is not more than one-third as much as it would be, if it was all gold, we can get pay for the gold, if not for our work. I always adopt this plan when I have to fill a tooth on the grinding surface, from which I have taken the nerve, for less than six dollars. In the incisor teeth, tin, or any other metal but gold, should not, of course, be used. All cavities that can be filled with tin, can be filled equally well with gold; therefore, we have no inducement to use tin but its cheapness."

It evidently did not occur to Dr. Clark that he might possibly be giv-

ing a better service for smaller compensation, to his poorer than to his more fortunate patient, who was able to pay for all gold. The method he used was solely for the purpose of economy. The idea that a filling must be in harmony with its environment, and not obstruct, but aid nature in her work of repair, formed no part of his method, as the object was to get something cheap.

The value of a filling depends upon its ability to save teeth without regard to the cost of the material used. The only other consideration is that it shall offend the eye as little as possible. If the theory that tin exercises a benign or healing influence when placed in a carious tooth, be sound, the problem is how to eliminate its objectionable features, and extend the boundary of its usefulness. A cavity filled with tin, with an outside or protecting covering of cohesive gold, laminated, so as not to incorporate the gold in the tin, is in correspondence with nature, and more fully meets the demand of its surroundings.

Much that has been said in condemnation of tin as a filling material, is proved, on examination, to be without good reason. That tin foil, when made from the pure metal, disintegrates, or becomes powdery, is shown to be false. It is a mistake to charge tin with making the teeth black, when really it makes them of a brighter hue. Remove a tin filling after it has been in the cavity of a tooth for years, and the dentine will present a bright, healthy, dense appearance. Tin never penetrates the tubuli like amalgam.

**Method of
Using Tin
for Filling Teeth.**

But, it may be urged that all this sheds no light upon the most important part of this subject; i. e., the practical application of how to fill teeth with tin so as to remove the objections, and retain its virtues. In the filling of teeth, the first step is the preparation of the cavity, and, in the use of tin, there are no exceptions to the general principles laid down in the various text-books. Unsupported walls of enamel are to be broken down, and the decayed dentine removed. In doing this, however, no more tooth structure need be sacrificed than is necessary to accomplish the result. Being interdigititous, it spreads laterally, and does not need angles, dovetails, undercuts, or retaining pits to hold it in place. It is not refractory like cohesive gold, which only stays when it is anchored so that it cannot get away, but yields readily to pressure. It remains in place, not from necessity, but from choice. The removal of healthy tooth structure for retention is not required. It does not call for "extension for prevention," as tin itself prevents extension. By reason of this saving of tooth structure, many fillings may be almost entirely concealed.

Tin is introduced and manipulated in the same manner as has been

so often described in making cylinder fillings by the wedging process. It should be condensed into a solid mass so that it may be cut with a sharp chisel or excavator. This is best accomplished by heating the plugger in an alcohol or gas flame to a degree to render the tin malleable. This requires about 212 degrees F. The sensation of heat which the patient experiences is not so acute as that which follows the introduction of hot gutta percha, provided it is done with judgment and care. When the tin is consolidated, it should be flush with the enamel walls. So far, the work is done with the old-fashioned hand pluggers with large handles. The next step is to bring the flattened surface of a very light and extremely cohesive gold cylinder in contact with the surface of the tin, when a union of the metals takes place at an insensible distance, like the uniting of two drops of water. Continue this process until there is an outside covering of gold, which will finish down to a smooth and polished surface. For finishing, all that are required are sandpaper, cuttle fish disks and strips. It does not need to be burnished, as burnishing tends to impair the union of the metals by drawing the gold away from the margins.

All crystalline bodies under force or pressure, assume a definite form. The crystals of gold being spheroidal, the tendency under pressure is always toward the center. The same law which governs in the vital organ should be recognized in the treatment of pulpless teeth. It is a misnomer to call a pulpless tooth a "dead tooth." It is true that the process of tooth building is stopped with the death of the pulp, but, as the tubuli extend through the sides of the root, a certain amount of vitality may be maintained under proper treatment. This treatment should be in a way to cause as little change as possible in the conditions under which the tooth was formed.

There can be no question that tin in the root canal is as bland as it would be if encysted in the muscular tissue. Clinical experience has demonstrated that a root properly filled with tin will remain perfectly odorless, while one filled in the same manner with cotton and cement, or gutta percha, almost invariably gives off a most offensive odor on being removed. This odor is of the kind called "brassy" and is, no doubt, largely due to a decomposition of the amorphous substance which has been arrested in its metamorphosis. A similar odor is often detected on removing a cohesive gold filling, placed in a living tooth, which had been inserted with great care.

The question which naturally suggests itself is, will a filling of this kind stand the tests of crushing stress equal to those of cohesive gold or amalgam? Dr. White says "the best filling is one of about equal porosity with the dentine." Hardness, or the power to resist force when applied out of the mouth is not a scientific way of testing the value of a filling

when placed in a tooth, as the conditions are in no way similar. As before stated, the object is to obtain a filling that in its physical construction shall as nearly as possible conform to the healthy organ. The teeth are not set in the sockets the same as a post is put in the ground. They are cushioned in the jaw, and give way under pressure. Besides, the material of which they are made is the most elastic of any known substance. For this reason, billiard balls are always made of ivory.

There have been many teeth filled on the grinding surfaces, with tin, that have worn out in the center, and yet protected the walls of the cavity sufficiently to permit nature to make a secondary deposit almost as dense and hard as the enamel with which it was originally covered. A secondary deposit of dentine under a malleted cohesive gold filling would be rare indeed. How often do we see teeth crumble away while these fillings remain intact. It is more scientific to have the fillings wear and save the teeth than to have the fillings remain and the teeth decay. In one case, the filling may be easily replaced; in the other, the organ is lost, while the work remains.

This is not intended to cast any doubt upon the ability of the fillings we suggest, of withstanding the force of ordinary attrition, when placed in any part of the mouth which has been affected with caries. A practical application of this method in many different positions, has convinced your essayist of the correctness of the principle that correspondence and harmony, and not "crushing stress" are the true factors in tooth preservation.

The points we have endeavored to enforce are first, that the enamel of a tooth, being formed from without, in, plays no part in tooth development or preservation, except to act as a protecting covering; that the process of tooth building is from within, out, and continues from infancy to old age; that nature attempts to protect herself from the encroachment of disease, by a deposit of secondary or adventitious dentine; that if the cause of decay is external, the recuperative force is from within; that the operation of filling teeth should be based upon a recognition of these processes of nature, and that the material when placed in contact with the dentine should be in correspondence with the amorphous or structureless substance with which the tubes are filled; that of all the materials which have been employed, tin most nearly meets these conditions; that the objection, to tin of color, softness and a tendency to oxidation, are met by proper manipulation, and the field of its usefulness extended; that it suggests a theory of practice scientifically correct.

If these conclusions are well founded, it removes from the operation of filling teeth the empirical and the doubtful, and inspires the patient with confidence and hope. Being in harmony with natural law, it lifts a burden from the shoulders of the practitioner, and makes a pleasant

duty of an irksome task. Having a scientific basis for its foundation, it elevates the standard of dentistry, and lends dignity to a worthy calling. Above all, it mitigates the pain and suffering attendant upon operations in the mouth, from which even the most heroic shrink. If we succeed in dispelling the doubt of its practical utility from a single mind, our labor will not be in vain.

At least, it is not unreasonable to expect that the presentation to this society of a subject so important, both to dentist and patient, will stimulate discussion and evoke criticism. To this field we invite you, as no one mind can be the repository of all knowledge.





Second District Dental Society of the State of New York.

Meeting, November, 1901.

A regular meeting of the Second District Dental Society of the State of New York was held on Monday evening, November 11th, 1901, at the residence of Dr. F. C. Walker, 226 Schermerhorn street, Brooklyn, N. Y. The President, Dr. W. J. Turner, occupied the chair and called the meeting to order.

The minutes of the previous meeting were read and approved.

Dr. Halsey presented the following paper:

The Moulded Top Amalgam Crown.

I wish to describe a simple method of restoring to usefulness the roots of a molar where no part of the crown remains. We are often called upon to restore such teeth, either for simple masticating, or for the attachment of a bridge or artificial denture.

After healing the alveolar abscesses, which usually accompany such conditions, fill the extremities of the canals with gutta percha points coated with a good antiseptic paste, and ream the canals to receive metallic dowels. I prefer square iridio-platinum of proper size and tapered to meet requirements.

Two dowels are sufficient in any molar and should project from one-eighth to one-quarter inch when cemented in place. I prefer making a mix of soft amalgam, and then mix cement and seat the dowels, using a surplus of cement sufficient to cover the exposed ends of the root, working the amalgam into the cement while both are plastic. Clean the root edges of cement and contour up until ends of dowels are covered and the shape of tooth is restored except the cusps. The top should be left flat with about three thirty-seconds of an inch space for articulation.

At the next sitting the crown may be finished with an amalgam top moulded in one of several different ways. I usually get a sufficiently

accurate top by filling into the counter for such cusps of an ordinary die plate, but an impression can be taken of a neighboring molar in the mouth, from which an excellent top may be made.

The top must be made during patient's absence so that the amalgam shall be thoroughly set when used. The top is attached by cold soldering, and an excellent articulation may be secured by careful work.

The crown should be polished at still another sitting, and when finished is certainly an excellent operation both in appearance and utility.

The upper portion of the crown and cusps should always be made of contour amalgam, which, when polished, always maintains an excellent color.

This line of work has been fully described by Prof. Flagg in his "Plastics," except the use of the moulded top of amalgam, which I began using about six years ago, and which certainly gives a much better finish to the operation than attempting to carve out the cusps from the plastic amalgam.

Discussion.

A Member.

What do you mean by cold soldering?

Dr. Halsey.

Brighten the surface of a set filling, and you can add to it at any time. Begin with a soft mix, burnish it against the surface of the old filling, and you cannot get it apart. I guess some of you gentlemen have never read Dr. Flagg's paper on plastics. You should do so. Take an amalgam filling which is set, brighten the surface, and begin with a fresh mix which is soft; burnish it on to the surface, and you can add to it as you wish. You do not need any undercuts. It adheres to the original filling, and you cannot break it away. The moulded top is made separately and it is fastened to the third mix. You often have occasion to build up the stump for a gold crown. I often build up in this manner. Where I do not use gold crowns in the back of the mouth, in twelfth year molars or wisdom teeth, I much prefer topping a crown in this manner. I will give just one point in regard to making them. I use the die plate, because I can swage the amalgam into it. Take a piece of flat pine to cover the opening, make it a little more than full, and cap it with those soft pieces of pine.

Dr. Jarvie.

I think this is a very effective way of treating roots to make them useful—those that are strong enough and firm enough, and infinitely better than ninety per cent of the gold crowns we see. Finished as well as the one exhibited by Dr. Halsey there is no opportunity whatever for the lodgment of any food. Perhaps you could not always get absolutely perfect union

under the gum, but at the same time the result would be much more useful and durable than many of the gold crowns that are put on, and I think it is a very valuable idea to carry away from this meeting.

Dr. Shaw.

Is it necessary to use an iridio-platinum pivot? Would not a German silver one answer just as well?

Dr. Halsey.

No; that is just the point. The iridio-platinum dowel I think is the strongest we have. I do not believe anything compares with it in strength.

Dr. Shaw.

Would not German silver be strong enough? It is cheaper, too.

Dr. Halsey.

Possibly. The amalgam has no effect upon the iridio-platinum. I have anchored many bridges with the iridio-platinum dowel, where one end of the bar would be anchored in an amalgam filling. One is in my wife's mouth, and it has been doing service for ten years and is exceedingly strong. You do not need to ream out frail roots too much. I have made many old roots serviceable by the method described. Many old roots are carious at the end, however, and cannot be used on that account. Perhaps the German silver would be strong enough, but I have not used it.

Dr. Schmidt.

I do not think amalgam would hold as well around German silver as with iridio-platinum.

Dr. Halsey.

I cannot say, as I have never used it. This is not expensive. Charge enough for your work.

Dr. Kraemer.

I have used the German silver posts, not on account of the cheapness, but because I happened to have some that would fit in the case. I found there was a little space around the pin—not within a year, but after about four or five years—so I do not use it now.

Dr. Shaw.

German silver is used a great deal for posts, and I wanted an expression of opinion whether there was any objection to it.

Dr. Halsey.

I do not make any claim that this operation is new. It is an old one, having been described by Dr. Flag; but it is useful.

Matrix and Retainer for Amalgam Fillings.

I have a little apparatus to show which has been **Dr. R. G. Hutchinson, Jr.** in use in my office practically every day for a number of years, but probably has not come to the notice of many of you. It is not, perhaps, highly scientific, but it is intensely practical, and to me such things appeal most strongly.

What I refer to is this little matrix and retainer. You all know that it is a common thing for plastic fillings to fail at the cervical margin. Sometimes, as in the case with amalgam fillings, the failure is due to the excess of material at that point not having been trimmed off properly. I have many times found extensive inflammation, with loss of tissue, resulting from a large excess of amalgam projecting against the gum, and often in cases where there was evidence of the utmost care and skillful manipulation manifested in the rest of the filling.

Of course this condition need not exist if the operator is careful to trim the filling with suitable instruments before it has had time to set. The use of this matrix, however, renders the operation much more sure and simple, and the contour may be built up more perfectly and left in contact with the adjoining tooth, as the band is so thin that no appreciable space is left.

I consider it advisable after removing the matrix to pass a small quantity of dental fiber through so that any loose bits or possible excess that may have been forced through will be removed.

As regards cement fillings, we all know of their tendency to disintegrate at the cervical margin. My experience has proven conclusively to me that it is more often due to imperfect manipulation of the cement than to the material itself.

Without a matrix it is a most difficult matter to make a perfect cement filling in, for instance, an anterior approximal cavity involving the grinding surface of a molar. If you use a quick setting cement and pay proper attention to the cervical margin, the chances are that you cannot give the contour the fullness and form you desire, or perhaps more commonly the contour and grinding surface receive the most attention and the cervical margin is left to suffer.

There may be a surplus of material bulging out of the cavity, or more likely a space left unfilled where recurrent caries will begin almost immediately. If you succeed in making a perfect filling by burnishing down the cement while soft at the cervical margin, unless the rubber dam is on, your instrument will conduct the moisture from the gum margin and disintegration of the cement will result at that point on account of its having become wet while setting. When this matrix is applied, the gum margin is held away from the cavity, giving full access to the cavity margin and excluding moisture.

Another point that is gained is the ability to trim the margin perfectly after the matrix is on the tooth. I have often found that where I thought the margins perfect, there were thin edges which appeared only after adjusting the matrix, and the failure to remove these would un-

doubtedly have made the filling less serviceable. This applies more especially to cases where the cavity extends so far under the gum margin that the rubber dam cannot be applied and there is considerable hemorrhage.

In cases of badly broken down third molars in the lower jaw, where the gum has grown into the cavity, it is possible to hold this growth out, exposing the entire cavity, and restore the tooth perfectly with any plastic material desired.

I do not advocate the use of this matrix for gold fillings, but have, upon several occasions, where there was not time to make a separation, been successful in that direction. The matrix can be applied to any approximal surface of any of the molars or bicuspid of either jaw. If it does not draw in close to the neck of the tooth, it can be forced up by wedging in a pellet of cotton.

There is no doubt in my mind that many failures could have been averted by the use of a good matrix, for since using this one I have had much better results than before, and also better than a good many other men whose work I have seen and who did not use the matrix.

Of course perfect results will not be obtained unless care is taken to carry the filling material up to the cervical margin against the matrix, and if a small amount is forced through it can be easily removed after the filling has set and the band has been taken off the tooth.

This little instrument is made by J. W. Ivory, of Philadelphia, and can be obtained from almost any dealer in dental instruments. I recommend it primarily because it is my firm belief that much better results may be attained with than without it, and, secondarily, because it saves considerable time and trouble for the operator.

There are two widths of bands that come with this. You will see the narrow one is just stuck in between the teeth, and the wider is adjusted. Perhaps some of you do not know of the fibre that I speak of, although probably most of you use it.

Dr. Ferris. Where does Dr. Hutchinson get this fibre?

Dr. Kraemer. You can get it at the depots. It is called dental fibre, or tokum.

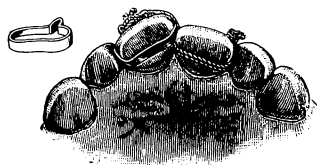
Dr. Hutchinson. The S. S. White people have the fibre now, although I did not get mine from them at that time.

Simple Method of Rotating a Superior Central Incisor Tooth.

The simplicity of this method is my only excuse
Dr. Ellison Hillyer. for presenting it. I do not know whether the method is new, or whether it has been used by some of you to a greater or less degree.

The case illustrated presents a right superior central incisor somewhat out of line; the patient, a young lady about nineteen years of age. The appearance of the mouth was but slightly marred, but the lower lip decidedly irritated at times by the position of this malposed tooth. Being a school teacher, the patient desired the correction by the method least liable to cause her pain and annoyance and requiring the least conspicuous appliance.

I made a band to which I call your particular attention. Fitting the band as usual closely to the tooth, I allowed a little excess in length, soldering the ends together. With a small nosed pliers I "took up the slack," so to speak, in the form of a loop which gave me at once my attachment for subsequent use. This saved all the time and trouble of soldering a loop or lug to the band. Since this trial I have used the method of making such loops in several cases with great satisfaction.



Drying the incisor teeth thoroughly, and keeping dry until all the ligatures were in place, I cemented the band upon the right central. When this was hard I took a section of Chinese grass line and, making a knot, placed the double grass line between the left central and lateral incisors with the knot upon the labial surface. Carrying the grass line back of the left central incisor and between the central incisors to the labial surface of the right central incisor, I fastened the grass line to the loop upon the band. When the moisture of the mouth comes in contact with the grass line, the latter must necessarily shrink, and as it progressed in this case the right central incisor gave way. It was necessary to change the grass line but once, and that after three days.

At the end of the week the tooth was ready for the retainer, the patient having suffered very slight discomfort.

Commenting upon this method I find it is equally easy to accomplish double rotation as single by use of the grass line.

Some years ago Dr. Frank French, of Rochester, read a paper before the Odontological Society, at which he mentioned grass line, which is probably identical with that used by Dr. Hillyer. He spoke of double rotation of the central incisors, with no other appliance than this grass line, wrap-

Dr. Hutchinson.

ping it double, making the hitch about midway across the labial surface, then knotting the two ends tight, and allowing the moisture to contract the line. There was rotation and a separation necessary in that case. I tried it very shortly afterwards with perfect success. The ligatures had to be changed occasionally, but, of course, after the teeth were rotated there was no other appliance necessary. The line will not slip. It can be fastened by tying it together and knotting the ends.

Dr. Hillyer. I wish to commend Dr. Hillyer for the simplicity and ingenuity of his band. In making similar bands I have usually avoided the necessity of soldering lugs or catches to the band, by leaving the ends longer than necessary and pinching them tightly together around the tooth in the mouth, then running solder between the ends, which can afterwards be turned in such direction as may be desired, forming a hook. I think Dr. Hillyer's method is better as being less likely to irritate the lip. I have no doubt that this device will be applicable and effective in many cases, but I think this a good occasion to draw attention to the ease with which we may be deceived in the regulation of teeth. In the actual case under discussion, I do not believe that the central incisor carrying the band has been rotated to any great extent. In the application of force, it must be remembered that tension is equally distributed throughout the apparatus, consequently there is as much strain at one end of the fixture supplying the force as there would be at the other. In order, therefore, to produce movement only at one end, it becomes necessary that at the other end, or what we call the anchorage, the device should be so constructed as to obviate any possible movement in the anchor tooth. This probably is very rarely accomplished, but usually it may be so controlled that the movement at the anchorage would be so slight that when the retaining fixture is applied the anchor tooth will return to its original position. In the appliance under consideration, and in the specific case before us, the anchorage is not secure. On the contrary, from the standpoint of physics, there is no reason why the strain on the lateral incisor should not be greater than the strain upon the central, which was intended to be moved, for the reason that the root of the lateral would be less resistant than the root of the central, and these two teeth are equally under the stress of the fixture. There being no spaces between

the three teeth, it would become evident with a little study that, supposing the intermediate tooth, the other central, to be immovable, the fixture would be inoperative because the corners of the adjacent teeth would simply be drawn tightly against the sides of the intervening one. This tooth, however, not being immovable, it would be inevitable that the lateral and other central would really operate as anchor teeth, with the result that the shortening of the strands of the grass line would force the intervening central outward, and just as soon as this tooth reached its correct position in the arch, *apparently*, the corners of the central and lateral would have been carried in, and this I think is what has occurred in the present instance. In double rotation I could conceive that the result would be quite different, as the two teeth touching at the center would prevent any motion except the swinging outward of the opposite corners, and in single rotation where there is sufficient space, and where the grass line could be carried around two teeth rather than one, the anchorage thus being more secure than the tooth to be moved, rotation could be obtained.

I wish to thank Dr. Ottolengui for his commendation of the simple little "loop band;" it was formerly my practice to use the bands as he has described, and I have also taught that method to students; this, however, has given excellent satisfaction wherever used thus far.

As to Dr. Ottolengui's criticism regarding the results obtained and the doubt expressed as to what really occurred, I can but say that when the retainer was applied the left central and lateral *had not moved* and the right central was in the alignment desired. Dr. Ottolengui speaks of the left lateral incisor as being the *only anchor tooth*. The force is applied at the point of resistance *between* the central and lateral and they would *both* have to move, if movement took place. True, the shrinkage takes place throughout the whole of the length of the line, but the force is delivered upon the right central which, being in the position of one to two, had to give way.

I have several things to exhibit. The first is a model of one side of an upper jaw, showing four molars. One of them is, of course, supernumerary, and very small; but it has four distinct cusps.

The next is a model of a very small jaw, one of the smallest I have ever seen. The subject came to my office last week. It is $2 \times 1\frac{5}{8}$ inches, measured through the center of the symphysis to the outside of the condyle. The patient is a middle-aged lady.

I have here a small bottle of alloy. Last spring I paid a visit to Dr. Flagg, and he showed me a lot of what he called "Omnium Alloy."

He said this was the first bottle of it which had ever gone out of his hands, and of course I have treasured it very carefully. I do not think it will ever be put on the market. Dr. Flagg is a very old man, and has practically retired from active practice. He said it took him nine years to perfect it, and it was rather a pet of his. I would like to have it go on record that this Omnium Alloy was brought before this society, in this year—1901—so that if anyone should ever launch an Omnium Alloy on the market we shall have this start of him.

Dr. F. C. Ferris,
Ichthyol in
Pyorrhea Alveolaris.

I wish to speak of the use of ichthyol, in the treatment of pyorrhea alveolaris, and my manner of making the application of the drug. The article is sold by Merck & Co., and is not unknown to you, as you must have heard of its effectiveness in the treatment of skin diseases. The rhinologists speak very highly of its attributes. Its physiological actions, which are: ability to penetrate unbroken skin; a powerful vaso-motor constrictor on mucus surfaces; its ability to abstract oxygen from the tissues; its tendency to promote metabolism, etc., led me to try it in a pyorrhea pocket. I found by washing out the cavity with a fifty per cent aqueous solution I got good results; but by combining it with lanolin, equal parts, I have had marvelous results in the most acute inflammatory stages of the disease, sometimes treating a pocket but once to get a healing.

My method of introducing this mixture, which is rather dirty-looking, and has an unpleasant odor, is to take a small collapsible lead tube, remove the top and solder a platinum or gold point to it. Fill the tube with the ointment, and it is always ready for immediate use. Fill the pockets with the mixture, and the lanolin will retain the drug for about five or six hours. This treatment will relieve the most painful conditions.

The drug has proven very satisfactory, and I think that it is worthy of a trial. If any of you find a difficult pus pocket that is very painful, the application of ichthyol will give almost instantaneous relief—at any rate, within a couple of hours. In pus pockets, having a fistulous opening, patients suffering so they could not masticate on the tooth, after one treatment have returned to me with almost normal looking gum.

A Member.

What is the strength of the solution used?

Dr. Ferris.

I use a fifty per cent solution aqueous to wash out the pus pocket, and I use the lanolin with the idea of having it stick fast. It is syrupy and quite thick, but fifty per cent is a useful solution.

Dr. Ash,

I have had quite a good deal of experience with it. It first came under my notice in connection with a case which was being handled by a friend of mine

—a physician. The patient was of a very nervous temperament, and was suffering from intense neuralgic conditions. The trouble originated in sciatica, and after having tried various methods for relieving the pain, ichthyol was finally resorted to, without any thought that it would prove all that was claimed for it—and with remarkable results. The patient was relieved almost immediately. I was called in to take care of a tooth with which she was suffering. She was a chronic invalid, and not able to go out. I found that not only was she suffering with a tooth with an exposed pulp, but she also had an intense neuralgic condition of the right side of the face. After applying a sedative to the exposed pulp, the pain still continued. Ichthyol was applied. I had occasion to make another call in the neighborhood, and I came back about half an hour afterwards and found her asleep, and her husband said it was the first sleep she had had in twenty-four hours. I use it pure, painting it on the outside.

Dr. Hillyer.

What was your subsequent treatment there?

Dr. Ash.

I was not called in to take care of the patient's general condition; I was called in to take care of the tooth, but in the absence of the physician I used the ichthyol to relieve the condition present. There may be one point worth mentioning, and that is, that if you have never used ichthyol, you will have an idea that after having gotten it on you are not going to get it off again. That may deter you from using it. The general appearance of the drug would lead you to think that, but it is easy to remove by simply washing with plain water, or water and soap. It looks like iodine when it is applied, but it is easily removed.



Central Dental Association of Northern New Jersey.

Meeting, November, 1901.

Dr. Chas. A. Meeker presented the following resolution:

"Whereas, We believe that a perfect denture and normal health of the tissues of the oral regions conserves in the highest the perfect health in the body of growing children of the coming generations, and

"Whereas, At the present time there is no organized or endowed effort for the microscopical histological, and bacteriological study of the embryonic, and organized teeth, therefore, be it

"Resolved, That a committee of four be appointed by the president to present to Mr. Andrew Carnegie, of New York, the need of an endowed institution for such studies and others allied therewith, and to most respectfully ask his aid in furtherance of the same."

Dr. C. S. Stockton, seconded the above resolution and the same was unanimously adopted.

Discussion of Dr. Head's Paper.

Dr. Head was good enough last summer to mention to some of us this line of work that he had become interested in and I can supplement what he has said by some work which I have done in this direction with perfect satisfaction.

It is almost unnecessary, in these days when decay is so thoroughly understood, to lay much stress on the fact that enamel is so porous as to permit the entrance of so many of the micro-organisms that are found in the buccal cavity or to go into the field of the action of these micro-organisms, particularly the acid-producing ones, on that enamel.

I do not think Dr. Head has over-stated the position when he says that enamel in this condition, no matter how slightly it may be affected, is sure to become the seat of eventual decay. If this enamel can be rendered inert to the action of the micro-organisms, certainly the field which he has opened to us is of immense value.

In my own use of the twenty-five per cent pyrozone—I have not used the sodium dioxide, although I recognize what an excellent bleaching agent it is—I have converted the ethereal solution into an aqueous solution because I found that the ethereal solution evaporated so rapidly that I did not get so long a steaming or so thorough a bath as I was able to obtain with the aqueous solution, and I think that the aqueous solution is fully as bleaching in its character as the ethereal.

Dr. Head laid too little stress I thought on the treatment of the pulpless teeth, which we have been accustomed to bleach by forcing the pyrozone in with the electrical current. The method which has been suggested is much more rapid in its action than we can procure with the electrical current, or, as we term it cataphoresis. The steam generated in the use of pyrozone seems to enter the tubuli more rapidly than it could be forced in under the electrical current. I think fully one-half the time, assuming that a sitting of twenty-five or thirty minutes is required with the current, for it did not take over ten or twelve minutes to produce a far better color with the pyrozone—after which the ethereal pyrozone was sealed in under gutta percha. At the next sitting, the tooth which I have in mind, which, when I started, was badly discolored by the decomposition of the organic matter in the tubuli, had returned to a color even lighter than the normal color of the adjacent teeth, which was desirable, because there is always a return of the dark color when the tooth has been filled.

I think Dr. Head's paper is the best exposition
Dr. Chas. H. Meeker. I have heard of the *modus operandi* of bleaching the teeth with peroxide of hydrogen, and I have read a good many articles on the subject.

Although I can vouch for nearly everything he has said I do not use sodium dioxide for the simple reason that no matter how much care we take with it we are very apt to burn the mucous tissues. I have done that once or twice and I have given it up altogether and use nothing but the twenty-five per cent pyrozone.

My method is to put the twenty-five per cent pyrozone in the little bleachers we get, I call them chafing dishes; I then put the bleacher over a spirit lamp and distill it down; this makes it a hundred per cent stronger than the twenty-five per cent; I use it with the hot ball burnishers and find it does the work more rapidly than the twenty-five per cent. It dries off as Dr. Hart says all the ether and we have an aqueous solution nearly double the strength of the twenty-five per cent. I do not use the electrical method, cataphoresis at all now. I use the pyrozone and the hot ball burnishers, and, as Dr. Hart says, I find it does the work more quickly than cataphoresis.

The suggestions made in regard to bleaching I
Dr. R. M. Sanger. can confirm in some slight degree. I have been using pyrozone for bleaching ever since it was brought before the profession; I think by Dr. Meeker, but in some way, I do not know why, I discovered that I got much better results by introducing the pyrozone into the cavity and then forcing under the cotton a blast of hot air, applying it as hot as I could use it. Not being an

original investigator like Dr. Head I did not go any further to find out the reason why I had good results, but accepted them as such and perhaps was too selfish to hand it along. But certainly my experience, as far as it has gone, has been in confirmation of what Dr. Head said tonight.

In regard to the bleaching qualities of the Doctor's paper, of course I recognize that there is no better thing as far as we know than pyrozone used with heat, but I have found that sealing up the pyrozone in the cavity gives the best results. Let it go for three or four days and you will be surprised at the color of the tooth. Let it remain thoroughly sealed with hard gutta percha and it is the best way I know of for bleaching teeth. There is nothing in the world any of us could do that gives more satisfaction to the patient or that they will talk about more than having a dark tooth returned to its normal color.

I was very much interested in Dr. Head's paper
Dr. J. H. Osmon. as doubtless we all were. I had the pleasure of sailing with him a few days last summer on the lake and he explained about this new method of his, and I was very much interested in it.

There is one part of the subject that he spoke to me about last summer which he did not touch upon tonight, although I hoped he would do so.

I think we are all familiar, to a certain extent, with the bleaching of dead teeth by the use of pyrozone and sodium peroxide, but the point I wanted to have him bring out tonight especially was the bleaching of live teeth, the bleaching while there is a live pulp in the tooth and I wanted him to tell us what the effect is. He has had quite considerable experience in bleaching live teeth and I think he might give us a little more information.

The method he has described to a very large extent I have followed with the exception of the hot ball burnisher. I have used the hot blast of air as Dr. Sanger has, but usually after getting the pulpless tooth ready and getting the appical end thoroughly sealed; I put the pyrozone in and seal it in and leave it in for two or three days and renew it from time to time until I get the tooth as near the normal color as possible.

I can thoroughly indorse, as far as my experience has gone, all that Dr. Head has done. I have had a great deal of pleasure and of success in the use of peroxide of hydrogen and the hot blast. The hot iron and the burnisher I have not used; the time may come when I may find it necessary to try the hot iron. So far I have achieved all the success which I believe I deserve,

Dr. B. F. Luckey.

and all the success which most other men could achieve, with the hot blast from my electric blow-pipe upon cotton soaked with twenty-five per cent pyrozone, after sealing it up for from three days to a week and then, if necessary, a repetition of the same thing. With one or two exceptions I have not yet found any cases that failed to reach my ideal of bleaching.

I am also happy that I can say that in almost all those cases the result has been permanent and that has been a puzzle to me, knowing the porous nature of the teeth and the readiness with which the discoloration might return.

I have made it a practice in the filling of these teeth—I am speaking of dead teeth now—to invariably varnish, with a transparent varnish, the inner surface of the tooth; this tends to protect them from the ingress of any possible leakage or staining from that point, but does not protect them from staining from the outward surface, and we know there is a chance of their staining.

The bleaching of live teeth has been to me a matter of a great deal of interest, and while I have not pursued that perhaps as diligently as I might have done, I have achieved some results which were satisfactory. The one thing I would like to achieve, and the one thing I have never been able to, is the excoriation of those white spots and those blotches on the surface of the teeth, of a greenish yellow color, and those large white spots which are analogous to the spots which many people have on their finger nails and which are a blemish and a cause of worry to the possessor. If Dr. Head, or any other good doctor with a head, could help us out on this score I think we might learn tonight something which would pay us for coming even further distances than some of us do.

What does Dr. Luckey mean by bleaching a
Dr. Head. white spot brown or yellow?

I spoke of the white spots besides the dark
Dr. Luckey. colored spots that we often meet with. As to bleaching white spots brown I am ready to plead ignorance, but when I take my seat I hope that if anyone wants to bleach white spots brown, our good friend, Dr. Head, will enlighten them as to how to do it.

I have had more or less experience in using
Dr. W. F. Pruden. pyrozone, and one point that I have not heard come out tonight is that after sealing the pyrozone up in the tooth canal, probably an hour after it has been put in, the patient will experience pain, which may continue for two or three hours, and I have felt the necessity of limiting the quantity of pyrozone to be sealed up

in the root canal because many patients have found it very painful, and I have had to remove such dressings.

Dr. Tracy,
New York. It is a well known fact that the methods of bleaching have grown and that our knowledge of the subject has grown greatly, and I think the recent advances, as suggested by Dr. Head, are going to be a great help to us.

I am not sceptical about the results at all, because I know of them by getting them myself. But this dessication of the tooth structure and the use of these strong caustic agents must, it seems to me, diminish the pliability of the tooth, and I have known of some cases in which such a tooth upon receiving a slight shock, which a normal tooth would withstand, has suffered injury. I would like to hear Dr. Head's ideas on that subject as to whether it does weaken the tooth structure or not.

Dr. Head. Concerning the very excellent point that Dr. Hart made of using the aqueous solution of pyrozone, I should say that for the sealing process that is a great advantage; but we must remember that ether has a much greater penetrating power than water, and while I should think it would be advisable at times to use the aqueous solution, I think that the ethereal solution should better be used at the start, in order to get a thorough saturation of the enamel.

Concerning Dr. Meeker's excellent remarks and his concentration of the twenty-five per cent solution of pyrozone to fifty per cent, I am very glad to find that this method gives beneficial results because I should have thought that heat applied to the twenty-five per cent solution of pyrozone would drive off the oxygen and reduce it to a state only of ether or water. But, of course, practical results must give way to theory, and in that respect, I, of course, bow to Dr. Meeker. I wish, however, that he would perhaps, at some time explain more fully the apparatus he uses, because the ordinary bleacher held over a lamp with pyrozone in it would, I am certain, cause a driving off of the free oxygen and tend to make that solution inert.

Concerning the use of the hot air blast I should say that for drying out a tooth there is nothing better, but to put the hot air blast upon a tooth soaked in pyrozone is to defeat, largely, the object for which it is used, for hot air simply tends to draw the oxygen away from the tooth, rather than to drive the steam into the tooth; it would tend to dry out the water rather than to liberate the oxygen in the tooth. I can understand, however, that a portion of the oxygen would be liberated in the tooth substance in spite of the defective method; the hot iron would be a much more scientific and effective course of procedure.

Concerning the spasm or pang which the gentleman spoke of in the use of pyrozone in the tooth canal I shall speak more at length when, according to request, I elaborate the method I use for bleaching the enamel of live teeth. But concerning the pang that comes from sealing pyrozone in the canal with hard gutta percha in my opinion the explanation is quite simple. Because we have pyrozone sealed up in the canal, pressure is exerted. We all know that if pyrozone is placed upon the finger this tingling or pang is at once perceptible, and we can readily imagine that if it were applied to the raw flesh of any other part of the body the same feeling would be obtained. Therefore when we consider the anatomical construction of the tooth, we can understand that if too great a pressure is used, or if the tissues are extraordinarily sensitive, as sometimes occurs, this pang will be felt. We have all experienced the same phenomenon in cases where the peridental membrane is extremely irritable, and with such cases I would suggest that the treatment be used with care and moderation; and that the pyrozone be not sealed up in the canals, and that longer periods be allowed to elapse between treatments.

Concerning the strength of the teeth so treated I have found that the enamel does not seem to be seriously hurt.

The great cry, in times past, has always been, whenever teeth have been bleached, that the structures have been undermined. In certain teeth which have been bleached and where the enamel has been already weakened by decay, there may have been a tendency for the enamel to crack, but that is exceptional. We should be very careful in our treatment of teeth with pyrozone in such cases. But Miller seems to have discovered that nascent oxygen applied to enamel and dentine has a way of destroying the structure. This is simply in the line of Miller's researches, and, therefore, with such excellent authority on that side I should consider that the gentleman's remarks are well worthy of consideration. But with the large number of teeth that I have sterilized and the large number of spots I have taken out of enamel where superficial decay is found, I can truly say that there does not seem to be any practical softening of the tooth structure, and I am sure that the life of the enamel has been increased by removing the germs of decay which would otherwise have undermined it, had they been allowed to remain in their normal state of existence.

We now come to the question of bleaching the enamel of live teeth.

**Bleaching
Living Teeth.**

I mention that in my paper, but it is evident, because I started with the fundamental principal of taking pulpless teeth where the canal had been filled, that the second stage of the treatment has been overlooked.

The process that I mentioned, of using a hot instrument to drive the steam from the inside was the first stage of the bleaching. Of course where the pulp is alive we would not pack the canal with pyrozone and use hot instruments inside; at least not more than once. But where there is no normal opening and the tooth is in all its natural stability, and superficial decay has not started upon the enamel, the process, as I have described in my paper, is as follows:

The tooth should be isolated with the rubber dam, the enamel should be thoroughly dessicated and dried. The cotton soaked in pyrozone should be applied over the stain and the steam should be driven into the stain by means of a hot instrument until the enamel is thoroughly infiltrated with this hot steam pyrozone. To a certain extent, of course, the oxygen has to be liberated by this process. But there is pyrozone within that tooth structure which contains nascent oxygen unliberated. If the hot instrument is applied on those stains not only is the steam driven in, but also driven out by the hot instrument, and the nascent oxygen is let loose within the enamel itself. I am sure, gentlemen, those of you who have tried this process will bear me out, there is a distinct whitening. The heating with the hot instrument on the enamel I consider one of the most vital steps. It is absolutely the reverse of that which is obtained by drying with the hot air blast. That simply drives out the pyrozone as an evaporation of a liquid when it should come out in the form of liberated nascent oxygen.

Concerning the hurting of the patient I would say that we have all noted that a greater sensibility in the enamel is to be found between the ages of ten and twenty, but we also find that between those ages there are comparatively few stains. The stains that trouble us the most come between the ages of twenty-five and forty, and when the patient reaches the age of twenty-five or thirty the hot instruments can be used with comparative ease.

I do not advise the use of the hot instrument any hotter than the patient will stand it, otherwise you will find that the bleaching process will come to a premature termination. But I will say that with care and judgment, good results can be obtained. I would also advise that great care be taken not to use this process too long at any one time, where the pulp is at all irritable. I have known patients to suffer from this pang, which has been mentioned, after the process has been applied, and sometimes they will say, "Doctor, it seems as if pins and needles were going through the nerve." This would seem to indicate that the pyrozone had penetrated, not only through the enamel, but through the dentine. Thus great care should be taken that the pulp is not irritated beyond the possibility of easy restoration.

The point which I especially wanted to bring out was the great advantage this process would have in getting rid of discolorations due to pock marks. We have again and again tried to get rid of discolorations, and yet at the bottom of the pock mark we would find the discoloration, and while we have smoothness we would still have discoloration. By means of this process, used on these pock marks, I have been able, with a hot polishing instrument, to absolutely make these pock marks clean and white; enamel that looked speckled and dark and unwholesome, became clean and white and remained so.

Dr. Stockton. Have you had any difficulty in regard to acid troubles?

Dr. Head. I have tried this method, I suppose, as many as one hundred and fifty times, and I have never had patients come to me and say they had any acid trouble. I have often tried this process in cavities where the dentine has been stained.

I think we somewhat over-accentuate the danger that will come to a pulp by being temporarily touched by nascent oxygen. It is an erodent, but it does not seem to me it is an erodent of a deadly character, and while, of course, I should be the last one to ask the profession to be careless in the use of any drug, still I should think that I could truthfully and honestly offer the suggestion that I make tonight about peroxide of hydrogen without any fear that you will regret it at any future time.

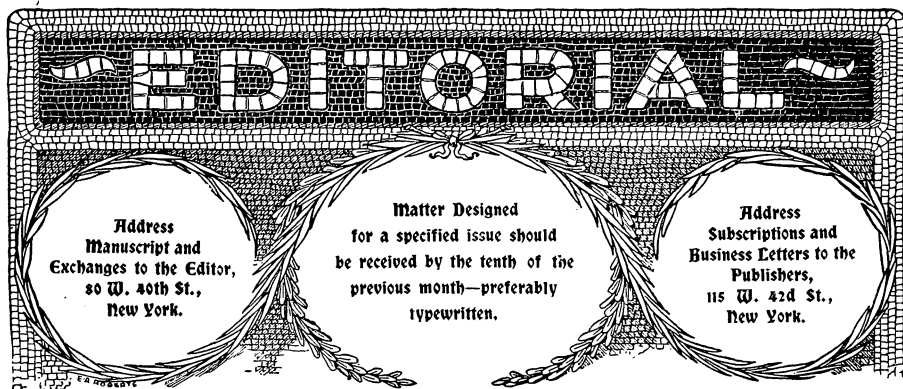
Dr. Meeker. In reference to the heating of the twenty-five per cent pyrozone I will say that I first received my instructions from Dr. Evans, who I suppose got them from the chemist. At the first attempt I made in the small evaporating dish over a spirit lamp, it exploded and it was some time before I was able to do it successfully. Now I put a piece of mica over it, put it in a pair of tweezers and heat it in that way. To prove the difference in the strength you need only to get a drop of the twenty-five per cent pyrozone on your hand and then let a drop of the pyrozone prepared in this way get on and you will see the difference.

I was operating this afternoon on a central incisor that was badly eroded; the patient was a woman of some sixty-three years of age; originally the cutting surface of this tooth was filled with gold and she broke off the labial edge so that I had to build it up. The tooth was very much stained; it was a dark brown and the pulp was alive. I tried the twenty-five per cent pyrozone with the hot iron without success. I then prepared some in my evaporating dish and put that on and in about fifteen minutes the stains disappeared. The erosion was very bad on all the teeth and it was necessary to get it away, and this did it, and I per-

formed the operation satisfactorily to her. It is true that tonight she may have some little pain and I told her so.

I am very much obliged to Dr. Meeker for his explanation, and I can readily understand that, as I suggested before, his method was not thoroughly comprehended because, of course, we all know that heat applied to peroxide of hydrogen is the very thing that will drive off the nascent oxygen, and doubtless it is the way that he protects it with mica which makes the concentrations possible.





Dental Degrees of Undergraduate Practitioners.

**Dr. Cheaney's
Views.**

The following letter from Price Cheaney, M.D., D.D.S., of Dallas, Texas, opens a fruitful field of discussion:

"While recently examining Polk's Dental Register, in search of statistical information, I was very deeply impressed with a thought which has come to me before, but not with such force. It is the need of some arrangement by which the large number of old practitioners who have devoted a great part of their lives to the profession of Dentistry, but who, through the fault of circumstances, have never been able to graduate, can be permitted to get credit for the information and experience which they possess, and obtain a professional degree without having to go through the kindergarten work required by the present rules of the National Association of Dental Faculties.

"The action of the Association at its last meeting in lengthening the course from two to three years has made the possession of a degree a still more difficult matter for them.

"There are many of these dentists who, if this could be accomplished with a reasonable course of study at college, would be only too glad to take advantage of the opportunity, but who have arrived at a time of life

when they cannot afford the time and are not willing to start at the bottom of the ladder with boys (many of whom have never even seen a tooth extracted before entering college) and relearn fundamentals.

"My attention was forcibly attracted to the injustice of this requirement in the winter of 1894, while I was Dean of the Northwestern College of Dental Surgery in Chicago. A friend of mine who had been a student and practitioner of dentistry for years, and who was almost a walking dental encyclopedia, matriculated with us, but was so thoroughly disgusted at the thought of having to devote three years reviewing familiar work, that he gave it up without completing the course.

"I am familiar with the difficulties in the way, and the history of diploma selling which led to the present requirements and restrictions, but when I see that good men, and I speak advisedly when I say "good men," are kept out of degrees, I feel that it ought to be made possible for them to get credit for their knowledge in college courses.

"Unless one has taken the pains to carefully look into statistics, it is hard to realize how many undergraduates there are practicing dentistry. Take my own State for instance; out of 542 dentists recorded in the last Dental Register, there were only 194 graduates.

"How are we to remedy this matter and allow men of merit opportunity for advanced standing, without letting down the bars for favoritism and diploma selling, which the present rules were designed to prevent?

"My suggestion for a solution of the problem is this: Let the National Association of Dental Faculties appoint an examining committee from their Association not having over one member from any one college, to meet at the same time or directly before or after their meeting, and let them examine applicants for advanced standing and give certificates admitting to the second, third or fourth years as the circumstances may warrant, and let this certificate be accepted by any school in the association. Certainly there could be no objection to an arrangement of this kind which would be manifestly fair to all.

"It strikes me that the colleges could well afford to adopt a rule of this kind, as it would open up a large field to them, and I venture to say will meet with the approval of the profession at large.

"In my own graduating class ('84 Baltimore College of Dental Sur-

gery) there were eighteen out of forty-four graduates who took advantage of the old rule which accepted five years practice as equivalent to one course, and among them any one now looking over the list will find some of the most prominent names in the profession for professional attainment and for having enjoyed the honors of the profession. Among these I may mention the names of Dr. J. Leon Williams, of London; Dr. W. W. Walker, of New York; Dr. C. A. Meeker, of New Jersey; Dr. William Crenshaw, of Atlanta. I mention these names because no one familiar with the literature of the profession will for an instant question the justice of giving such men credit for the knowledge which they possessed, nor claim that the interests of the profession was damaged by allowing them to obtain degrees without having to sacrifice their valuable time reviewing fundamentals.

"I suggest the above as fit matter for discussion by the profession, and at the next meeting of the National Association of Dental Faculties."

**Discussion
of the
Proposition.**

There is unquestionably food for thought in the subject presented by Dr. Cheaney for discussion, but we doubt the feasibility of his proposed solution of the problem. Did the Faculties Association so choose, it could, of course, appoint the committee to examine candidates for advanced standing. But when it is considered that the labor of conducting this examination would probably be without remuneration, this, coupled with the further fact that the successful candidates might elect to attend schools no member of whose faculty had any of the labor of examining them, it is not probable that there would be exactly a rush to be appointed on this examining committee.

A second and more serious objection would be the necessity for the candidates to travel, in many instances a long distance, in order to meet the examining committee. When the Faculties Association should meet in the East for example, as it will this year, a candidate from California and many intermediate points, would be obliged to pay in railroad fare a sum greater than the tuition fees at college.

If advanced standing is to be given to undergraduate practitioners, it does seem that the faculties of the various schools represented in the Faculties Association, could be trusted to maintain any entrance examination that might be set by the Association. Indeed, we cannot believe otherwise.

**Honorary
Degrees in
Dentistry.**

We may pertinently extend the sphere of this discussion to ask why it is that honorary degrees in dentistry have been discountenanced? Great universities are constantly conferring honorary degrees in Arts, Letters, Law, Theology and Medicine. Why, then, should it be a dangerous practice in Dentistry? Is it because our dental schools are not great, in the sense that the universities are? May they not be trusted to hold the honorary degree as a reward, to be conferred only upon those who merit the distinction because of their personal contributions to the progress of the profession? Or are dentists and dental college faculties so commercial in their instincts or so controlled by politics and politicians, that the right to confer honorary degrees would be abused? Again we say we cannot believe that our colleges are controlled by men so little to be trusted, and surely an honorary dental degree, righteously awarded, would be an incentive that would lure many men onward, to the great advantage of dental science and dental progress. Let us hope that the Faculties Association will discuss both of these questions, and arrive at a liberal and a wise conclusion.

The Philadelphia School of Anatomy Reputable.

Our attention has been called to the fact that in an announcement appearing in the Editor's Corner, in our last issue, the language is sufficiently ambiguous to have caused some, perhaps, to have misunderstood our true meaning, with the result that injustice may have been done to the Philadelphia School of Anatomy.

The policy of *ITEMS OF INTEREST* is to serve the dental profession and as a means to this end, it has aimed to advance the progress of dental education. While we have never hesitated to expose alleged schools engaged in a nefarious traffic in diplomas, nothing would be further from our intent than to cast the least reflection upon any reputable college. That anything appearing in our pages could be understood, or misunderstood, so as to do this, is very much regretted.

Let us state first that the Philadelphia School of Anatomy is a reputable institution, chartered in 1820, and that it has been in continuous existence ever since. Eminent men, such as Drs. Agnew, Dacosta, Keen,

Garrettson and Boenning, have been connected with it. At the present time the Philadelphia School of Anatomy occupies rooms in the Philadelphia Dental College building (though separately managed) and the dental students take their dissecting in that school. The Philadelphia School of Anatomy furnishes dissecting facilities and instruction to anybody who makes application and receives, not only the dental students, but physicians, medical students, artists, etc.

Unfortunately, in our last number allusion was made to this school in connection with the exposure of a fraudulent concern, and in such a way that, as we are informed, some have supposed that we meant to include it as belonging to the same category.

The article in question was published at the request of the secretary of the National Association of Dental Examiners, and was more especially addressed to members of Examining Boards throughout the States. We stated, what was true, that "one Jesse M. Belber applied for a license to practice, to the Board of Examiners of the State of Ohio, stating that he had a diploma from a school in Jersey City. The Secretary of the Ohio Board, of course, knew that no dental school exists in that section, but encouraged the applicant to take the examination and notified him to bring his diploma. When he appeared, he presented two diplomas, both of which were photographed for future use."

We then gave the exact reading of the two documents presented by Belber, one of which was a certificate from the Philadelphia Dental College. Following this we presented the specific charge that the alleged Jersey City School was fraudulent. Up to this point we simply narrated facts, and as our accusation of fraudulency was solely against the so-called "Central University of Medicine and Science," the language cannot in any way be construed as attacking the Philadelphia School.

Then followed, however, these lines: "By the action of the secretary of the National Association of Dental Examiners in furnishing this matter for publication, warning is thus promptly given to the Examining Boards throughout the country to be on the lookout for "graduates," from either of these schools.

Exception has been taken to this paragraph, yet no more was intended than the literal meaning of the words. This man presented himself as a graduate from two schools, one of which did not exist at all.

As evidence of "graduation," from the Philadelphia School of Anatomy, he presented what in appearance, judged by the style of type, etc., was a diploma, but which when carefully read proved to be merely a "Certificate for Proficiency in practical Anatomy," it being further stated therein that the holder had attended but one course. In many States it is permitted, and in still others it is mandatory, that Examining Boards should issue licenses to practice dentistry upon the presentation of diplomas from reputable dental or medical schools. In the paragraph under discussion it was intended to warn Examining Boards that holders of such certificates from the Philadelphia School of Anatomy are not "graduates," in the statutory sense that would enable them to demand license or examination for license. It was deemed that the warning, coupled with a verbatim copy of one of the "certificates," would have been sufficiently intelligible, and we regret that it has not proven so.

We must not overlook the fact, however, that the caption under which this announcement appeared read: "Bogus Diplomas Discovered by the N. A. D. E." In explanation we have only to say with regret, that the "s" which pluralized the word "diploma" was a type error; though we might claim that inasmuch as Belber presented as a diploma that which was merely a certificate of proficiency in a single branch, that particular document was a "bogus diploma."



THE EDITOR'S CORNER

With malice
toward none,
with charity
for all

Questions will be answered in this department, provided the answers would be of general interest. After publication our readers are cordially invited to make further reply, criticism or comment.



The last number of the *Dental Cosmos* has the report of a paper by Dr. S. B. Palmer, of Syracuse, in which he reviews the papers which dealt with the subject of "Extension for Prevention," and which were read last year before the Second District Dental Society, and published in full in our May number.

Extension for Prevention.

Dr. Palmer further elucidates his electro-chemical theory, and cites the following experience: "During the writing

of this paper, while riding in the country, I had an opportunity to observe an illustration of the cause and effect in connection with a natural law, not only limited to decay of wood set in the ground, but as applicable to the subject under discussion. An old line of telegraph poles had been dug out, to be replaced by something more modern. The rains had removed the adherent soil from the butt of the poles, which demonstrated the effects of the principles referred to more definitely than I had before witnessed. The wood being cedar and the soil by the road rather dry and heavy, decay had progressed slowly and by

distinct lines. The poles appeared to have been set in the soil about four feet. At a line or girdle upon the wood corresponding with the surface of the ground, there was a depression from two to two and one-half inches deep upon an average. The decay extended toward the end which had been in the ground, from ten to eighteen or twenty inches. The depression gradually lessened in depth toward the bottom."

In the course of the discussion which followed, Dr. Wilber S. Rose made the following rejoinder to this argument:

"Since receiving the essay, I have spent the time at my disposal in wondering at the principles advocated, indorsement and objection alternating to form the current induced by the essayist's inductive reasoning. I have questioned if sufficient examples have been given to establish the rule. I have wondered if the ground, after, all, had much to do with the disintegration of the post, since this same ground enveloped the unaffected bottom that surrounded the girdle of decay, and since in the old style of picket fence, where the pickets penetrated the stringers, they would decay at that point of contact as readily as would the posts in the ground. The iron deck of a freight ship will wear longer where the friction of travel occurs than in unused but exposed places. The combined influences of water and air seem to produce the deterioration, and air seems to be quite an essential factor, as the bottom of a wooden ship will last longer in the water than out of it. I have also wondered why a live post—i. e., a tree—does not disorganize at the ground line. It is in a similar situation and subject to the same influences, and if electricity be one of the disorganizing elements should be greater, as the fluid of the tree makes it a better conductor. You will first notice the manifestations of decay in the branches of a tree, and you have all known trees to thus lose their entire tops and new growth begin and a new top form. There seems also a discrepancy in the comparison with the post that the tree supplies, as the former is dead, while the latter, like the teeth, is alive. If there is any analogy between the tree and the tooth, the vulnerable point is not at the cervix."

Dr. Rose also reviewed the arguments offered by Drs. Black, Johnson and Wedelstaedt, and in closing offered the following verses:

"Extension for Prevention."

Extension for prevention is the hobby now we ride,—
We found it in Chicago, Black's and Johnson's glowing pride;
But it quickly ambled North and South and to our Eastern shore
Till it dispossessed the microbes, and our fillings fail no more.

We've the gnathodynamometer, that shows the biting stress
Exactly to the pennyweight, eliminating guess;

We have scales to weigh our mercury, and instruments to show much
No contraction, slight expansion, and how amalgams flow.

Much is due our Western *confreres*; Wedelstaedt has pointed out
That the author of our *Items* gropes in scientific doubt,
That the snows of forty winters lie up-piled upon his skill,
That to tools he is a stranger, and his methods fraught with ill;

That a live and modern dentist touched with Western skill and lore
Cannot fail to make a filling good for eighty years or more;
He extends the fickle borders till they're all in open sight,
All except that 'neath the septum, which he's sure is watertight.

And with magic hoe and chisel he'll displace the ugly bone
Quicker far and with less effort than it could be left alone!
And he'll fill the larger opening, trim and polish to surprise
In less time and for less money than if it were half the size.

Then our lady's first bicuspid is a tooth of beauty rare,
With the sunrise on its mesial side and sunset in the rear,
Clasped effulgent in occlusion, decked in double dove-tailed sheen,
Glittering gold 'round the corners, with a strip of white between;

Strip of white, esthetic blemish, just a hint of nature plain
Left to work upon his conscience and suggest a "date" again;
Harsh attrition, mundane duty, will in time efface this blot,
Then he'll revel in his glory,—place a gold forget-me-not.

And the pale though sound incisors pities he with artist's eye,
Mends their lustre with his fillings, thwarting failure by and by,
Thus excelling their Creator both in shade and sides immune,
Blessings on our Western brother,—to humanity a boon!

So our colleagues have revised us, and have made us up to date:
Where our fillings lasted forty years they now last forty-eight;
We are expert in prognosis, for a decade fairly proves
That the wedge and prism anchorage far surpasses wedge and grooves.

But the star whose zenith proudly once proclaimed the East's renown
Hath departed in the glory of the radiant Western sun,
Where with splendor grandly glorious symbols he in shafts of gold
Golden work by golden dentists,—passport to the streets of gold!

Dr. A. B. Boyd, of Carlisle, Ky., describes his
Solid Cusp Crowns. method of making solid cusp crowns, as follows:

"In the last number of *ITEMS OF INTEREST*, Dr. Thos. Larseneur gave his method of producing cusps for gold crowns. I think I have a better way. Instead of investing the tooth in moldine, I take the rubber ring that comes with the Mellotte's outfit and another ring of metal that will fit over it tight. I punch a hole in a piece of dam and then stretch it over one end of the rubber ring, holding it in place with the outside ring. I then select the tooth I wish to use and push through hole in dam to depth I want the cusps to be. Then set ring with tooth adjusted on partly open bench vise or other convenient place and

pour in the fusible metal. Either natural or artificial teeth can be used for model."

**Volumes of
Items of Interest
Offered.**

Any library connected with a dental society or college who desires some of the back numbers of *ITEMS OF INTEREST* may obtain them by writing to Dr. Edward B. House, Milton, Pa., who has six or seven complete volumes unbound, which he will donate to any library applying to him.

**Sublamine,
A New Bactericide.**

Messrs. Schering and Glatz announce that they have recently succeeded in preparing ethylenediamine-sulphate of mercury in solid form, which exhibits all the valuable bactericide effects of our most useful disinfectant, without causing the albumen coagulation of the tissue fluids, which hinders its penetration into the depths of the tissues, and without the irritant effects upon the skin of both surgeon and patient that so greatly interfere with its employment. It is a mercurial disinfectant fully equal to the corrosive chloride in bactericidal effect with greater power of tissue penetration, and without any irritant or caustic effects upon the hands or the skin. The ethylenediamine-sulphate of mercury is placed upon the market under the name of sublamine in the form of one gram (15 grains) tablets, colored red, in cartons of five glass tubes, each containing twenty tablets.

**Use of
Carbolic Acid in
Setting Crowns.**

Dr. Frederick W. Stephan of Chicago, Ill., makes the following report of his use of carbolic acid as an anæsthetic in connection with the setting of crowns:

The element of pain in the setting of crowns has never been given very great importance. And yet I have seen the most severe spasms of pain caused by this operation which has made the patient dread the thought of a crown thereafter. The pain seems to be caused by the irritating cement liquid coming in contact with the hyper-sensitive gum tissue.

The application of cocaine has proved very unreliable, and in some cases seems to have even aggravated the trouble. There is an advantage in setting a crown temporarily, for a few days till the gum tissues become fully adapted to the new conditions. This, however, does not always insure painless setting. To secure this result the following method has been used with uniform success:

The crown being finished, its inner surface is painted with carbolic acid ninety-five per cent. The tooth is then dried, and the crown placed over it in position, as it will be when set. It is allowed to remain there for a short time. The small quantity of carbolic acid which escapes under

the gingival edge anæsthetizes the gums. The crown may then be set without causing pain. Due care must be exercised to prevent cauterizing too extensively with the acid; though this is not difficult with a well fitting crown. A little alcohol should be handy to overcome the cauterant effect as soon as the operation is over.

The following announcement has been received
The First Volume from Dr. Sauvez, Secretary-General of the Interna-
of Paris Congress tional Dental Congress of Paris:
Proceedings.

"Paris, December 12, 1901.

"DEAR MR. EDITOR: The Committee of Publication of the Proceedings of the International Dental Congress of 1900, in today's session, has finally adopted the First Volume of the Proceedings devoted to general assemblies. We take pleasure in informing you that, thanks to the postal frank granted the Congress, the volume will be distributed (beginning December 25) gratis to the Congressists.

"Subscribers who are not members of the Congress will receive the volume upon receipt by M. Viau, treasurer, 47 Boulevard Haussmann, of the sum of thirty-six francs, the price of the subscription (charges extra).

"Persons not members of the Congress may obtain the three volumes successively by sending in their request to the Secretary-General, and the amount above stated to the treasurer. Very truly yours,

"The Secretary-General, Dr. SAUVEZ."

The Philadelphia Academy of Surgery, as
The Gross Prize trustees of the Samuel D. Gross prize, for original
Awarded to research in surgery, of One Thousand Dollars, have
Dr. R. H. M. Dawbarn. awarded this prize, after six years' interval, to Dr. Robert H. M. Dawbarn, of New York City. The treatise which won the competition was entitled "The Treatment of Certain Malignant Growths by Excision of both External Carotids." Upon this topic Dr. Dawbarn has worked, as opportunity served, for seven years past. The essay, when published, will contain the histories with pathologist's report in each instance confirming diagnosis of malignancy and specifying its variety, of forty carotid extirpations by the author himself; and as many additional by about a dozen other surgeons. At least two of these are members of the Philadelphia Academy of Surgery. By the terms of Dr. Gross's bequest, the prize essay must be published in book form, and a copy thereof be deposited in the Samuel D. Gross Library of the Philadelphia Academy of Surgery.

Senator Platt has once more introduced the
Patent Bill patent bill in Congress, and it is published below
in Congress. that those not familiar with it may understand its *motif*. If the dentists of this country really desire

to see the abuses which have been possible under a certain class of patents forever terminated, it will be wise for them personally, and through their State societies, to make some active effort towards the passage of this bill. Nothing influences legislators so much as the knowledge that a law is really demanded by their constituents. As all the Senators and Congressmen are now in Washington, and undoubtedly have dentists, we would urge all of those who read these lines to write a personal letter to their patients, advocating the passage of this bill, and we will be interested to see copies of the replies received.

S. 3096. A BILL.

Amending the statutes relating to patents, relieving medical and dental practitioners from unjust burdens imposed by patentees holding patents covering methods and devices for treating human diseases, ailments and disabilities.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-eight hundred and eighty-six of the Revised Statutes be, and the same hereby is, amended by adding thereto the following paragraph:

“But no patent shall be granted upon any art of treating human disease, or ailment, or disability, or upon any device adapted to be used in the treatment of human disease or disability, or attached to the human body and used as a substitute for any lost part thereof, or upon any art of making such device, unless such device is adapted to be put on the market and sold substantially complete and ready for use or attachment,” so that such section shall read as follows:

“Sec. 4886. Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof, not known or used by others in this country before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law and other due proceeding had, obtain a patent therefor.

“But no patent shall be granted upon any art of treating human disease, or ailment, or disability, or upon any device adapted to be used in the treatment of human disease or disability, or attached to the human body and used as a substitute for any lost part thereof, or upon any art of making such device, unless such device is adapted to be put on the market and sold substantially complete and ready for use or attachment.”

Sec. 2. That section forty-nine hundred and twenty-one of the Revised Statutes be, and the same hereby is, amended by adding thereto the following paragraph:

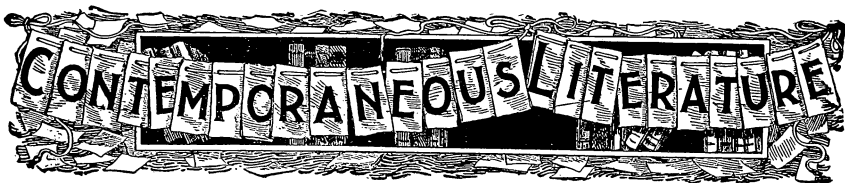
"Nor shall any suit or action be maintained for the infringement of any patent for an art of treating human disease, or ailment, or disability, or for any patent for any device adapted to be used in the treatment of human disability, ailment, or disease, or attached to the human body and used as a substitute for a lost part thereof, or an art of making such device, unless it appears that such device can be made and put on the market substantially complete and ready for use or attachment," so that said section shall read as follows:

"Sec. 4921. That the several courts vested with jurisdiction of cases arising under the patent laws shall have power to grant injunctions according to the course and principles of courts of equity to prevent the violation of any right secured by patent, on such terms as the court may deem reasonable; and upon a decree being rendered in any such case for an infringement the complainant shall be entitled to recover, in addition to the profits to be accounted for by the defendant, the damages the complainant has sustained thereby, and the court shall assess the same or cause the same to be assessed under its direction. And the court shall have the same power to increase such damages, in its discretion, as is given to increase the damages found by verdicts in actions in the nature of actions of trespass upon the case.

"But in any suit or action brought for the infringement of any patent there shall be no recovery of profits or damages for any infringement committed more than six years before the filing of the bill of complaints or the issuing of the writ in such suit or action, and this provision shall apply to existing causes of action.

"Nor shall any suit or action be maintained for the infringement of any patent for an art of treating human disease, or ailment, or disability, or for any patent for any device adapted to be used in the treatment of human disability, ailment or disease, or attached to the human body and used as a substitute for a lost part thereof, or an art of making such device, unless it appears that such device can be made and put on the market substantially complete and ready for use or attachment."

Sec. 3. That this Act shall take effect immediately upon its passage, but the paragraph added to section forty-eight hundred and eighty-six shall not be held to apply to any application for patent filed prior to the passage hereof, nor to patents granted upon applications filed prior to said date; nor shall the amendment to section forty-nine hundred and twenty-one affect the rights of action that may have accrued prior to the passage hereof.



Pseudo-Anchylosis of the Lower Jaw, Accompanied by a Remarkable Formation of Salivary Calculi.*

By DR. DON JUAN PIOSA, Jerez de la Frontera, Spain.
(From *La Odontologia*.)

The clinical case which I submit to the consideration of my colleagues, is one of those few which rarely present themselves in our offices, for it needs an effort to believe possible such abandon on the part of the patient and so many errors of diagnosis on the part of all those that intervened in its treatment.

I have had occasion in my practice to treat many cases of excessive accumulation of salivary calculi, but I have never witnessed such a remarkable production as the case in question in which, as our readers can judge for themselves, a number of circumstances concurred, and all of them of a sort to favor such an excessive formation.

I shall first give the clinical history, and end this article by making such remarks as the case may suggest.

History. In the first days of December, 1900, there came to my office a youth, age twenty-three, by the name of Jose Carrasco Diaz, complaining of severe pains in the left side of his face. Not being in the office that day, my son, who attends to patients in my absence, examined him and observed a large odoema of the left cheek. The upper and lower lips were joined to the jaw from the labial joint by strong fibrous filaments, which prevented even a cement spatula from penetrating between the mandibles.

Face to face with such an abnormal case, he suspended the examination and made an appointment with the patient for the next day, his object being that I might see the case. The next day the patient again presented himself at the office, accompanied by his mother, and thanks to

*A remarkable case of great interest both to the dentist and general surgeon.—Ed.

her, I was enabled to learn the principal data, which, as his mother explained them to me, are these:

When three years of age he suffered from an affection of the mouth, which the attending physician diagnosed as buccal gangrene, cauterizing repeatedly with nitrate of silver the many ulcerations on the gums and internal surface of the cheeks. She says that at this time his jaw began to become immovable to the extent that in the very same year in which the disease first made its appearance, the child could not open his mouth.

Under these conditions, and without being very much disturbed by this anomaly of her child, as she thought it would pass away, began the decay of the temporary teeth.

Through the interdental spaces caused by the decay of the deciduous teeth, he was able to take some nourishment, but after the complete eruption of the permanent teeth, no space remained through which to introduce solid nourishment and he was forced to limit his alimentation to broths and milk.

He then went to consult some physician of this neighborhood and some charlatans who were there for some time, practicing surgical operations right and left; the latter agreed to perform an operation on his face which would deform him, but would not say that he would be cured.

In view of the latter professional opinion, he became resigned to abstain from any further surgical intervention until he was advised to see a practitioner of the Santa Isabel Hospital, who performed extractions, and enjoyed a reputation as a strong man, as he proved to our unhappy patient, for, in endeavoring by means of a lever to separate the jaws by sheer force, after making him suffer horribly, he accomplished nothing but breaking his right upper canine and thus opened a door, so to speak, through which to introduce nourishment. In consequence of the fracture, there remained an opening one-quarter cm., through which with some trouble he introduced food as his scanty means would permit, making use for this purpose of his thumb and the first two fingers of his right hand, and by pressing them together he succeeded in passing it from the vestibule to the buccal cavity where the perfectly trained tongue would receive it, and, after pressing it against the palatal arch, with the help of saliva, he effected its deglutition.

During this period he was on two occasions almost asphyxiated in consequence of overindulgence in liquors which caused severe vomiting, and as the expelled matter could not pass out through the mouth, it became choked therein and in the nasal passages, almost closing up the glottis.

At the age of nineteen he was called upon for military service, but at the examination he was declared useless for the service of arms. The

next year the first right molar became carious, and an alveolar abscess developed, which caused him in a fit of rage to extract this molar piecemeal, using a nail for the purpose.

Through the space left by this molar, he was enabled more easily to introduce food, and it was at this time, according to the patient, that the formation of the salivary calculi began, for ten or twelve months after this operation, performed in such an original manner, he began to feel trouble and tiredness in his left jaw, which later on altered into severe pain accompanied by great foulness of the mouth, which, determined as he was, not to suffer any longer, caused him to come to consult me.

In view of all these antecedents, I subjected
Examination. him to a minute examination, finding in the first place in his cheek a tumor, exceedingly painful under pressure, to an extent to make touching it almost impossible. Nevertheless I persisted and was able to feel a tumor of stony consistency of the size of a chestnut over the first and second molars. At first I thought I had to do with some sequila due to the eruption of the wisdom tooth, but soon I became convinced of my erroneous supposition, for, precisely at the level of the wisdom teeth, there were flabby tissues not painful under pressure, and there was noticed only an extreme sensibility on the level of the first and second molars, which made me suspect the existence of an extensive ulceration on the internal surface of the cheek. His breath was so foul that it was impossible to remain near the man. After separating his lips somewhat I could perceive some strong filaments, which by their consistency had all the structure of a cicatrical tissue, and prevented the introduction of the thumb or even probes to examine the vestibule of the mouth.

After recommending him to take some nourishment before coming, I told him to return the next day, when I continued the treatment of this original case. I made use of a mouth opener, and by pressing I succeeded in separating the jaws a little, but I had to suspend the operation on account of the excruciating pain it caused the patient. I swabbed all the tissues with a cocaine solution, and every fifteen minutes I pressed a little on the screw of the mouth opener until I succeeded in separating the jaws a little more, thanks to which and aided by the light of a reflector, through the space left by the fractured canine, using a flexible probe, I explored the whole dental arch without finding anything abnormal in the interior of the buccal cavity, if we except enormous masses of incrustation. But it was different in the vestibule, where could be felt a bulky body of the size of a chestnut, which in view of its stony consistency left no doubt that I had to deal with an enormous conglomeration of calculary material.

Being convinced of this, I took away the mouth opener and told him, although it might hurt, to close and separate his mouth as if he were masticating, and I had the satisfaction to see that, though with some difficulty, he effected some movement, an indication that the temporo-maxillary articulation was not in a state of ankylosis, but hindered in its movements by the cicatrical filaments mentioned before and the enormous incrustations along the dental arch.

In view of all this, I had no trouble in assuring his mother that, without an operation to deform his face, I would open her son's mouth, although I told her to have patience on account of the duration of the treatment, and above all that the patient should stop all work in connection with his trade as a cooper, in order that he could come to my office when I thought it necessary.

I began the surgical treatment by severing with
Treatment. a bistoury all the ligaments which united the labial tissues to the gums, which, although presenting great resistance to being cut, could not be compared to that presented by an extensive ligamentous fibre, if I may use the term, which united the masseter with the gingival tissues, which I cut with quite some trouble, using a strong-bladed bistoury. The rather insignificant hemorrhages following these incisions were controlled with astringent lotions, and after cauterizing the cut ends to avoid their joining again, and another application of the mouth opener, I terminated the first part of the operation.

On the following days I continued until I laid open finally all those enormous masses of incrustation in the very tissue of the cheek which, as I had expected, presented an extensive ulceration very deep and quite vicious looking with a necrotic bottom and irregular borders festooned with many pieces of the mucous membrane in a state of necrosis.

Perceiving then that the ulceration was maintained by the masses of incrustation with which it was in constant friction, I forthwith cut them away, succeeding in this not without great trouble. I made use of the dental engine, and after drilling holes in several points of the enormous block, I succeeded with the help of a gouge in loosening, little by little, some pieces until I uncovered the first and second molars, which had their roots almost fully exposed from the fact that the alveolar ridge had to a great extent been absorbed. I would have extracted them forthwith, but the small distance which the jaws would open deterred me, and I postponed it until the opening would permit it, as it did later on.

I subjected my patient to the constant use of antiseptic washes and cauterized the bottom of the ulceration with chromic acid, evening its edges and cutting away all hypertrophied parts of the mucous membrane.

I had constructed for him a mouth opener which he was to use con-

stantly, even while sleeping, and succeeded so well that at the end of five months the lower jaw was capable of performing all its natural movements.

**Lessons from
the Case.**

The pathogenic process in this case in my judgment could not have been more simple. We know that of the various diseases which may choose the buccal cavity of children for their seat, one of the severest and with most fatal consequences is noma, a form of buccal gangrene. Was this the disease my patient suffered from at the age of three? Or was it simply an ulcero-membranous stomatitis? We cannot say certainly; it was either the one or the other, for the history furnished by his mother did not clear up these doubts, but we are inclined to think it was the latter, for we have all had occasion in our practice to treat cases of this kind in children, which have as a principal etiological factor what is called *caquexia pauperum* acquired by the concurrence of conditions, usually accompanying misery, malnutrition, diet, damp and unhealthy dwellings. As all these conditions may be supposed to have been present with my patient, it must be believed that this primitive affection had no other source than organic misery. The physician in charge therefore gave his attention to the building up of this organism and disregarded local lesions, with the result that those ulcers on cicatrization became a knotty mass of tissues acquiring more and more solidity until finally rendering the functions of the muscles of mastication impossible, and reducing the lower jaw to a state of immobility.

It is not to be doubted that all these conditions proved fertile ground for the development and formation of the incrustation, for we know that the production of these calcareous concretions on teeth is due principally to the micro-organisms of the buccal cavity, not overlooking the chemical composition of the saliva. And what field more fertile could the bacteria select than a mouth deprived of all care and full of filaments condemning it to the most absolute immobility? In this way we can explain the enormous blocks of tartar completely covering the molars from the crowns to the roots, and uniting with their antagonists, imprisoned more and more those jaws.

On the other hand, it is certain that tartar engenders tartar, and, although its production may be slow, if not interfered with, it accumulates in large quantities, depositing with preference on the points nearest the mouth of the excretory conductors of the salivary glands, as it happened in this case.



Dental Medicine.

A Manual of Dental Materia Medica and Therapeutics.

By FERDINAND J. S. GORGAS, A.M., M.D., D.D.S.

Seventh Edition.

P. Blakiston, Son & Co.

Philadelphia, Pa., 1901.

The seventh edition of Dental Medicine, "a manual of Dental Materia Medica and Therapeutics," is a book of over six hundred pages, and considering the scope and magnitude of the work, is admirably well done.

Comparing this with previous editions of the same work it is much the same, and contains but little new and original matter, and throughout it is mainly a compilation of data previously published, although the work of compiling is nicely done, and credit is given to the source from which the matter is obtained.

Among the many valuable tables given are the physiological tables which give the doses of officinal and unofficinal drugs in both English and metric systems. Also valuable rules for regulating doses. But the most important of these to a busy dentist is the table for making percentage solutions, and the rules for finding the quantity of a drug in a given percentage solution.

The chapter on "important points in diagnosing affections of the mouth with a synopsis of treatment," is an interesting one and covers about all that the ordinary dentist is called upon to treat, and the treatment given is orthodox so far as it goes. The section on "Alveolar Pyorrhea, or Riggs Disease," page 168, gives a general history of the disease and its medical treatment, but the technique of its surgical treatment is entirely ignored, such as the devitalizing of the pulps of teeth when indicated, amputation of a root of a multi-rooted tooth, when it is necessary that local anæsthetics should be used, or the correcting of mal-articulation.

While the scope of this book is in the field of medicine, the treatment of alveolar pyorrhea without the surgical aspect is deprived of its most efficient means of success.

In "Suppuration or Abscess of the Antrum," page 154, the treatment for this trouble is primitive indeed in view of surgical methods of the present day. No classifications are given even to the conditions that are ordinarily present in such cases, nor their causes. The treatment consists first in the removal of the cause, whether it be projecting roots into the antrum, polypi, malignant growth, or necrosis, or the draining from the frontal sinus, after which the medicaments used for syringing would be indicated by the existing conditions.

Maxillary abscess, page 156, if treated surgically will not require soft rubber drainage tubes nor "safety pins."

The methods given on page 255 for the administration of ether and chloroform are *extremely crude*, and are verbatim as given in the second edition, 1885. After sixteen years one would naturally expect that better methods, of which there are many, would be advocated in a book that is supposedly up to date.

Under the head of cocaine, page 353, the dose for the hydrochlorate is given as one-sixth to one-half grain. On the following page appears "as a rule for ordinary minor operations from twenty-five to forty minims of a four per cent solution are needed."

In five minims of a four per cent solution there is one grain of the drug, and in forty minims of a four per cent solution there is one grain and three-fifths. This is a very dangerous statement, to say nothing of its being contradictory.

On page 71 the boiling-point of water is given as 202 degrees Fahrenheit. In the city of Manhattan water does not boil at that temperature. On page 35 it is suggested to apply a leech on the gum over the root of a tooth to relieve inflammation and congestion. The method advocated is "to make a small hole in a piece of bibulous paper which will adhere to a dry surface of the gum, and afford an opening for the mouth of the leech to approach the surface." Glass tubes are made for this purpose, five inches long and half inch in diameter. The end of the tube is placed against the surface to be depleted. To remove the leech it is suggested to "sprinkle with a little cold water, diluted vinegar, or powdered sugar." Chloride of sodium is more efficient.

Taken as a whole, this book would be a valuable acquisition to any library.

R. C. B.

Principles and Practice of Operative Dentistry.

By JOHN SAYRE MARSHALL, M.D.

Dental Surgeon United States Army, President Examining Board for Dental Surgeons.

Philadelphia and London, 1901. J. B. Lippincott Company.

This work embraces a large volume of six hundred and thirty-five pages in which there are seven hundred and twenty-five illustrations besides seven large illustrated plates, and it evidences very careful work as far as the compilation and historical data are concerned. The author is to be congratulated on the result of what must have required much painstaking labor, inasmuch as the greatest care has been taken to give proper credit to different authorities. This makes the work a very valuable book of reference for the student and very instructive for the general practitioner. By reason, however, not only of these qualities but because of the attention given to closely allied topics such as anatomy and embryology and the difficulty experienced by the reader in picking out the author's distinctive methods of operative procedure, it is very questionable whether the work will ever come into use as a text-book. The dedication of this volume to the late editor of the *Dental Cosmos*, Dr. James W. White, meets with such a fitting response as to permit this extract, "Who, through the nobleness of his character became the inspiration of every young man who came within the sphere of his influence."

The chief criticism of this production must be that the author has attempted too much, and in so doing has fallen short of practical details of special subjects. In a dentist, this is well nigh an inexcusable error. To illustrate this fault, under the section of histology of the dental tissues which takes up twenty-five pages, the description of the gums is made to occupy but sixteen lines. In a like manner the oral secretions are taken up and a faint intimation given of their value in pathologic conditions of the mouth, but there is no detailed account of their scientific use at the present day in diagnostic purposes. This amplification of methods and ambiguity of detail is spread over the entire work with the result rather of confusing a student as to the accepted methods of procedure at the present date.

A large portion of the volume is given up to the subject of diseases of the periodontal membrane and the surrounding tissues. In treating this topic, Dr. Marshall has seen fit to discuss the same in the most promiscuous manner, starting in with fifteen pages in chapter 28 and

coming back to the same topic in chapter 38. The result of this is that the author's classifications of pathogenic conditions of the pericementum and the surrounding tissues are not only very obscure, but they are not up to the present scientific status of the subject. Under the chapter on pyorrhea alveolaris, a lengthy record of authorities favoring the belief in the constitutional origin of the disease is given, dated back as far as Fauchard, 1746, to whom he gives the credit for first calling attention to the disease. There is no doubt that the disease was defined and discussed as a result of constitutional disturbances at least a century previous to this in some German and Latin works of that period, and very likely it will never be settled definitely who first described pyorrhea alveolaris as a symptom of constitutional disease. A careful revision of the work as presented would easily remove many present failings which, considering the author's well-known ability, are undoubtedly due to a hasty production of so large a volume.

M. L. R.

Orthodontia.

A Text Book for the use of Students in Dental Colleges and a Hand Book for
Dental Practitioners.

By J. N. McDOWELL, D.D.S.

Professor of Orthodontia in the College of Dentistry, University of Illinois;
Formerly of the Northwestern University Dental School; American Col-
lege of Dental Surgery; Member of Illinois State Dental Society;
United States Roentgen Society, Etc., Etc.
Chicago, 1901. Illustrated. E. H. Colgrove.

This work opens with a chapter devoted to the study, use and description of teeth. In it occurs a definition of "teeth," which is a slight deviation from and no improvement upon the definition to be found in the Standard Dictionary. Considering that teeth are loosely articulated in their sockets, and quite easily moved, it is a little puzzling to note that the author alludes to them as "hard, firm substances," etc. To the practitioner of Orthodontia, teeth should hardly be considered as "firm." The beginner in this field will often find teeth relied upon for anchorage anything but "firm."

In Chapter III. the author sometimes uses the word "interproximate," which is also occasionally spelled "interapproximate," and again "interproximal;" on one page he speaks of "approximal surfaces," and on the following of "approximate fillings;" there is no such word as

"positioned," which appears constantly; "occlusional" is also a new adjective not yet to be found in dictionaries, general or technical; the "subintermaxillary bone," mentioned on page 35, is one of which the reviewer must confess his ignorance; a somewhat humorous type error on page 44 introduces us to the "maledvelopment" of teeth; these, and other peculiar uses of words indicate the need of careful editorial revision, before a second edition is offered.

In a chapter devoted to a classification of malocclusion the author undertakes a modification of Angle's classification, hoping to render the same more "comprehensive" and "satisfactory." The result is certainly no simplification; consequently we fail to observe any improvement over Angle.

In chapter IX., devoted to a description of methods and appliances of previous writers, the name of Norman W. Kingsley does not appear at all. As Dr. Kingsley originated some of the most important operations in Orthodontia, the omission is inexcusable.

The chapter descriptive of impression taking and model making practically follows the Angle method, and is adequately explicit. The half-tone engravings from models, utilized as illustrations in this book, however, would not indicate any great success in utilizing the precepts here set down.

Part III. is devoted to etiology; a study of tooth movement; the uses and abuses of extraction in relation to regulation; the employment of the X-ray as a means of diagnosis; and there is a chapter on what the author is pleased to call "transition of occlusion." The illustrations in this part of the work are better, especially those cuts which have been borrowed. Some of the skiagraphs, however, have been manipulated to a painful degree, bearing as printed, practically no resemblance to real X-ray pictures.

The chapter dealing with "transition of the occlusion" is interesting and merits special comment. At the outset the author correctly describes the means whereby an examination of the occlusion will indicate whether or not the mandible is in normal or abnormal relation with the maxillæ, the determination being made mainly by a study of the occlusion.

What the author terms "transition of occlusion" has heretofore been called "jumping the bite." It seems to be psychological fact, worthy of note, that nearly all writers on dental subjects find the language of their predecessors inadequate to their own uses, and so feel constrained to formulate new terms. These are rarely accepted, the result being in the end that our terminology is overloaded rather than improved. All these philologists overlook the fact that, however desirable it may be to have words properly constructed from an etymological standpoint, after

all the main purpose of any word is to give adequate expression to a thought. Consequently a word or phrase already established and comprehended, must for a long time be better than any substitute therefor, however correctly coined.

In this discussion, however, we will momentarily make use of the author's term "transition," lest we unjustly record his views.

We find, then, that the lower jaw in proper pose, and bearing teeth properly occluding with their antagonists is normal. Two abnormalities are described as possible. There may be a forward pose of the mandible, with what the author calls mesial occlusion, the result being protrusion of the mandible. Secondly, there may be a backward pose of the mandible, with distal occlusion, and retrusion. The alteration of either of these malpositions, so that a normal pose of the mandible shall be resumed, or assumed, as the case may be, is what he terms "transition of the occlusion." It is manifest from his arguments that he considers either form of "transition" possible; indeed, he makes no discrimination which would lead his reader to imagine that one operation would offer any greater obstacles than the other.

The records in our literature do not bear this out, nor does Dr. McDowell give adequate evidence of the truth of his contention. He states that "before the age of ten years he has found it possible to take a case of normal occlusion and change the condition to mesial or distal occlusion *temporarily*;" but this shows merely that in individual cases at an early age there may be extreme movability of the mandible. It does not indicate as a corollary, that after the mandible has assumed a forward pose, and is in a state of protrusion, the application of headgear and pressure between skull and chin, will result in a restoration to normal position. A single recorded success of such a venture has already too long done service as a basis of argument for this operation. Why is it that no one since Allen has recorded such a result? The reviewer did report a similar instance, occurring in the practice of Dr. Jackson, but in that case the patient was but *two years of age*. Neither does the reviewer wish it understood that he considers it impossible to correct a protrusion of the mandible. Theoretically he admits the possibility, but it is accomplished with sufficient rarity, and the attempt is always so great a strain upon the patient, that all the obstacles should be elaborated rather than overlooked by writers on this subject. Moreover, an apparent protrusion of the mandible, with the mesial occlusion which is said to be of diagnostic value, may not be a protrusion in the Orthodontist's sense at all, but may be an excessive development of the mandible, the anterior portions of the bone being of abnormal length. The application of chin pressure in such cases would have disastrous results, if long continued,

and could not possibly achieve success. A differentiation of such cases, therefore, seems necessary when discussing "transition," the reviewer not hesitating to state that it is of far greater frequency than any other protrusion of the mandible. Yet it is not described at all by Dr. McDowell, nor does it come under any division of his classification.

"Transition," therefore, resolving itself into the common operation of "jumping the bite," or the movement of the mandible from a state of retrusion to a normal position, why do we need the new term?

The remaining chapters deal mainly with methods of correction, and are chiefly descriptions of old methods. On the whole, the book, though interesting in places, adds comparatively little to the literature of the general subject.

R. O.



Dr. John R. Thompson.

Dr. John R. Thompson, for many years secretary of the South Carolina State Dental Examining Board, passed away on Saturday morning, December 21, 1901, at his home in Newberry, S. C., after a few months' illness with dropsy.

Dr. Thompson was a good, kind, well disposed gentleman. To know him was to respect him. He was a good dentist, and a useful citizen. He leaves only one daughter and but few relatives to mourn his departure, but his good qualities and generous character were fully appreciated by his fellow practitioners, and he will be greatly missed by them.

GEO. R. HARDING.

Heber B. Barber.

Dr. Heber B. Barber, of Naperville, Ill., age thirty-three, died at Colorado Springs, February 5. He was a graduate of the Chicago Dental College, class of '89.



National Society Meetings.

National Dental Association, Niagara Falls, N. Y., Aug. 5, 6, 7.

National Association of Dental Examiners, Niagara Falls, N. Y..

Aug. 1.

National Association of Dental Faculties, Niagara Falls, N. Y..

July 31.

State Society Meetings.

California State Dental Association, San Francisco, June 10.

Colorado State Dental Association, Colorado Springs, June 17, 18, 19.

Connecticut State Dental Association, Hartford, May 20, 21.

Delaware State Dental Society, Wilmington, July 2.

District of Columbia Dental Society, Washington, Dec. 16.

Florida State Dental Society, Daytona Beach, Daytona, May 28.

Georgia State Dental Society, Macon, June 10.

Illinois State Dental Society, Springfield, May 13, 14, 15.

Indiana State Dental Association, Lake Maxinkuckee, June 24, 25, 26.

Iowa State Dental Society, Des Moines, ——— 6, 7, 8, 9.

Kansas State Dental Association, Hutchinson, May 13, 14, 15.

Maine Dental Society, Camden, July 15, 16, 17.

Maryland State Dental Association, Baltimore, March 28.

Michigan Dental Association, Grand Rapids, June.

Minnesota State Dental Association, St. Paul.

Mississippi Dental Association, Biloxi, May 20, 21, 22.

Missouri State Dental Association, Jefferson City, May 21, 22, 23.

Nebraska State Dental Society, Lincoln, May 20.

New Jersey State Dental Society, Asbury Park, July 16, 17, 18.

New York State Dental Society, Albany, May 14, 15.

North Carolina Dental Society, Raleigh, June 19, 20, 21.

Ohio State Dental Society, Columbus, Dec. 2, 3, 4.
Pennsylvania State Dental Society, Bedford Springs, July 8, 9, 10.
Rhode Island Dental Society, July 8.
Tennessee Dental Association, Monteagle, July 1.
Texas State Dental Association, Waco, May 13, 14, 15.
Vermont State Dental Society, Rutland, March 19, 20, 21.
Wisconsin State Dental Society, Milwaukee, July 15, 16, 17.

Massachusetts Board of Registration in Dentistry.

A meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates, will be held in Boston, Mass., March 5, 6 and 7, 1902.

Candidates who have applied for examination will report to the Secretary, Wednesday, March 5, at 9.30 a. m., at Tufts College Dental Infirmary, corner Huntington and Rogers avenues, and come prepared with rubber-dam, gold and instruments, to demonstrate his skill in Operative Dentistry. Any one who wishes may bring his patient. So far as possible patients will be furnished. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology; surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry and metallurgy, and will be held at Civil Service Rooms, State House, from Thursday, March 6, at 9.30 a. m., until Friday p. m., March 7.

All applications, together with the fee of twenty dollars, must be filed with the Secretary of the Board on or before February 26, as no application for this meeting will be received after that date.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the Secretary.

Candidates who have taken an examination, and failed, and desire to come before the Board again at this meeting are not required to fill out a second application blank, but must notify the Secretary as above in order to be examined. The fee for third and subsequent examinations is \$5.00.

G. E. MITCHELL, D.D.S., Sec'y.

25 Merrimack street, Haverhill, Mass.

New York State Dental Society.

The thirty-fourth annual meeting of the New York State Dental Society will be held Wednesday and Thursday, May 14 and 15, 1902, in the Assembly Hall, Hotel Ten Eyck, Albany, N. Y. The following essayists will present papers on subjects to be announced:

S. S. Stowell, D.D.S., Pittsfield, Mass.

R. H. Hofheinz, D.D.S., Rochester, N. Y.

W. V. B. Ames, D.D.S., Chicago, Ill.

Leo Greenbaum, D.D.S., Philadelphia, Pa.

J. Head, D.D.S., Philadelphia, Pa.

A. E. Webster, M.D., D.D.S., L.D.S., Toronto, Ont.

W. H. G. Logan, D.D.S., Chicago, Ill.

H. D. Hatch, D.D.S., New York.

A. R. Cooke, D.D.S., Syracuse, N. Y.

Members of the profession are cordially invited to be present. Headquarters, Hotel Ten Eyck. Special rates, \$3.50 per day.

JOHN I. HART, D.D.S., President.

W. A. WHITE, D.D.S., Sec'y, Phelps, N. Y.

Committee on Art and Invention Illinois State Dental Society.

The Committee on Art and Invention, Illinois State Dental Society, hereby invites and solicits a contribution of anything new in the way of appliances and inventions designed during the past year, which will be of interest to the profession in general.

Everything submitted should be sent directly to the undersigned with detailed description of its use and application by April 1, in order that it may receive proper classification and consideration in the presentation of the annual report at the coming meeting in Springfield, May 13 to 16.

The committee will care for and return each article submitted, but reserves the right to reject any which in their opinion may not be of practical value.

HART J. GOSLEE, Chairman.

580 Madison street, Chicago, Ill.

Maryland State Dental Association.

The next meeting of the Maryland State Dental Association will be held in Baltimore on the 28th of March.

Baltimore, Md.

F. F. DREW, Cor. Sec'y.

Seventh District Dental Society of the State of New York.

The thirty-fourth annual meeting of the Seventh District Dental Society of the State of New York will be held at the Osborn House, Rochester, N. Y., April 8-9, 1902.

A number of valuable papers will be read and a great many clinics given. All members of the profession are cordially invited.

F. MESSERSCHMITT, Chairman.

138 Main street, East, Rochester, N. Y.

Missouri State Dental Association.

The thirty-eighth annual meeting of the Missouri State Dental Association will be held at Jefferson City, Mo., May 21, 22 and 23. The business meetings of the association will be held in the Legislative Hall of the State capital. The clinics being held in the State penitentiary insure an abundance of clinical material. The papers to be read before the association are of a most interesting character. The meeting bids fair to be one of the best ever held in the State. It is certainly to be hoped that with a change in the time of holding the meeting, and many other attractive features, the attendance should be all that could be desired.

J. H. KENNEDY, Cor. Sec'y.

1814 Locust street, St. Louis, Mo.

Connecticut State Dental Association.

The thirty-eighth annual meeting of the Connecticut State Dental Association will be held at Hartford, Tuesday and Wednesday, May 20 and 21. Every effort is being made to have a large and interesting meeting. At last year's convention over two hundred were present. A larger attendance is expected this year. Exhibitors desiring space will communicate with the chairman of the Executive Committee, George O. McLean, Hartford, Conn.

FREDERICK HINDSLEY, Sec'y.

Bridgeport, Conn.

Vermont State Dental Society.

The twenty-sixth annual meeting of the Vermont State Dental Society will be held at Hotel Berwick, Rutland, March 19, 20 and 21.

Rutland, Vt.

THOMAS MOUND, Sec'y.

Mississippi Dental Association.

The next annual meeting of this association will be held in Biloxi, Miss., May 20, 21 and 22. Every effort is being made to make this a memorable meeting, and aside from visiting the seashore a programme of interest and instruction will be carried out. Papers, clinics, lectures, exhibition and demonstration of new medicinal preparations and appliances will be in order and the profession at large have a special invitation to attend.

GEO. B. CLEMENT, President.

L. G. NISBET, Secretary.

Iowa State Dental Society.

The next annual meeting of the Iowa State Dental Society will be held in Des Moines, May 6, 7, 8 and 9. All reputable members of the profession are cordially invited to be present.

Ames, Iowa.

I. C. BROWNLIE, Sec'y.

Central Dental Association of Northern New Jersey.

At the annual meeting of the Central Dental Association of Northern New Jersey, held on Saturday evening, February 15th, the election of officers resulted as follows: President, J. W. Fisher, East Orange; Vice-President, Wm. H. Pruden, Paterson; Secretary, Frederick W. Stevens, Newark; Treasurer, Chas. A. Meeker, Newark.

Executive Committee: C. F. Alfred Hane, Jersey City; C. W. Hoblitzell, Jersey City; F. Edsall Riley, Newark; W. Moore Gould, Newark; H. P. Marshall, Newark.

FREDERICK W. STEVENS, Secretary.

588 Broad Street, Newark, N. J.

Southwestern Michigan Dental Society.

The spring meeting of the Southwestern Michigan Dental Society will be held at Buchanan, Mich., April 8th and 9th. The present officers are: President, C. R. Rowley, Chicago, Ill.; Vice-President, Ruel M. Speer, Battle Creek, Mich.; Secretary and Treasurer, C. W. Johnson, Lawton, Mich.

C. W. JOHNSON, Secretary and Treasurer.

Lawton, Mich.